# STEEL

**PRODUCTION • PROCESSING • DISTRIBUTION • USE**

*For forty-eight years—IRON TRADE REVIEW*


# Contents . . . . July 12, 1937


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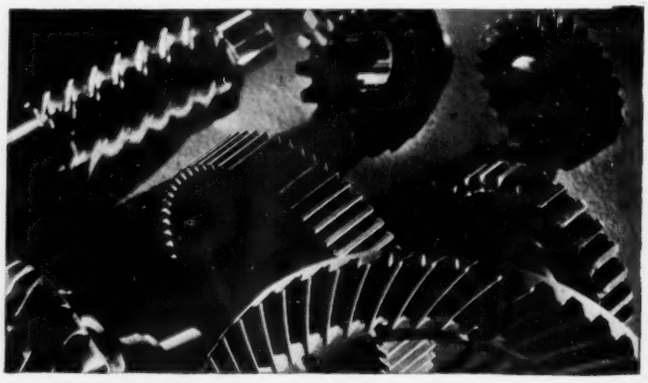
THE steel foundry, as well as the iron foundry, adds Nickel to many a composition. Adds it to fortify steel castings against the ravages of impacts, fatigue, stresses, and wear. That Nickel helps these castings live to a riper service age is proved by some of the case histories cited here. The two Pullmans shown are about to be joined with coupler knuckles (see inset) of Nickel Cast Steel. Just remember that when the impact comes there's a 20-ton bump between metals—and that there are heavy tensile and compressive stresses when the train starts and stops. Since 1928 most of these Pullman coupler knuckles have been made of Cast Nickel-chromium Steel. More than 10,000 have been placed in service. The possibilities of effecting long run economy in your equipment make the Cast Nickel Steels well-worth investigating.

NO service records are available for this particular collection of Nickel Cast Steel gears. But we have plenty of case histories of others of the same type and compositions that prove the ultimate economy of this material. An interesting photograph, this, from a number of standpoints, but especially interesting to makers and users of machinery because it shows how broad a range of gear applications may be supplied by strong, tough Nickel Steel castings. We invite consultation on the use of cast and wrought Nickel Steels, Nickel Cast Irons and other alloys containing Nickel in your equipment.

THESE curious globular castings came from the locks of the Panama Canal. They are called pintles—pivots on which the huge 79-ton lock gates turn. Before they were removed 20 years of service were chalked up to their credit. The one on the left (pressure side) shows only slight evidence of wear; the one on the right (slack side) shows dirt and scale but no wear. Another example of the downright economy of the Nickel Cast Steels.



**NICKEL CAST STEELS**

**THE INTERNATIONAL NICKEL COMPANY, INC., NEW YORK, N.Y.**

# As the Editor Views the News

SIXTY thousand, or 80 per cent of the 75,000 employes of steel companies who recently were idle because of labor troubles, have returned to work. This in itself indicates that CIO leaders were bluffing on a feeble minority when they launched their attack on May 26. William Green, chief of A. F. of L., recognizes this fact when he ascribes the failure of the strike to two outstanding reasons (p. 23): "First, because only a minority of steel workers were organized when the strikes were called and secondly, because public opinion was aroused by the violent policies pursued by CIO in automobile and steel."

• • •

**Well Worth Fighting For**

Public opinion still is the most vital force in the labor relations situation. Right now the man in the street and many of his representatives in congress are more sympathetic to the interests of employers, to the rights of employes to work with or without union affiliation and to the rights of citizens than at any time in five years. These improved relations with the public have been achieved through hard work against tremendous odds. They represent industry's greatest hope of security against further persecution by demagogues. Preserve and nourish this revival of public esteem. It is priceless.

• • •

**New Capacity Totals in Use**

Annual capacity for producing steel ingots has increased 289,500 tons since Dec. 31 to 69,534,194 (p. 25) and blast furnace capacity in the same period has mounted 215,000 tons to 49,819,737. The new totals are important as they will be used as the base figures for the institute's reports dating from July 1. . . Exports of iron and steel in May (p. 28) established new records. Shipments of finished and semifinished iron and steel were the highest since the World war and those of scrap constituted an all-time record. Scrap exports of 637,679 tons in May, following shipments of 427,886 tons in April, are significant in view of the controversy in Washington (p. 39) over a curb on excessive exports of this material. . . . Bethlehem Steel has enrolled 111 June graduates of American universities in a "loop" course (p. 29) —a practice which the metalworking industries can well afford to foster more systematically.

• • •

**Selectivity in Moving Scrap**

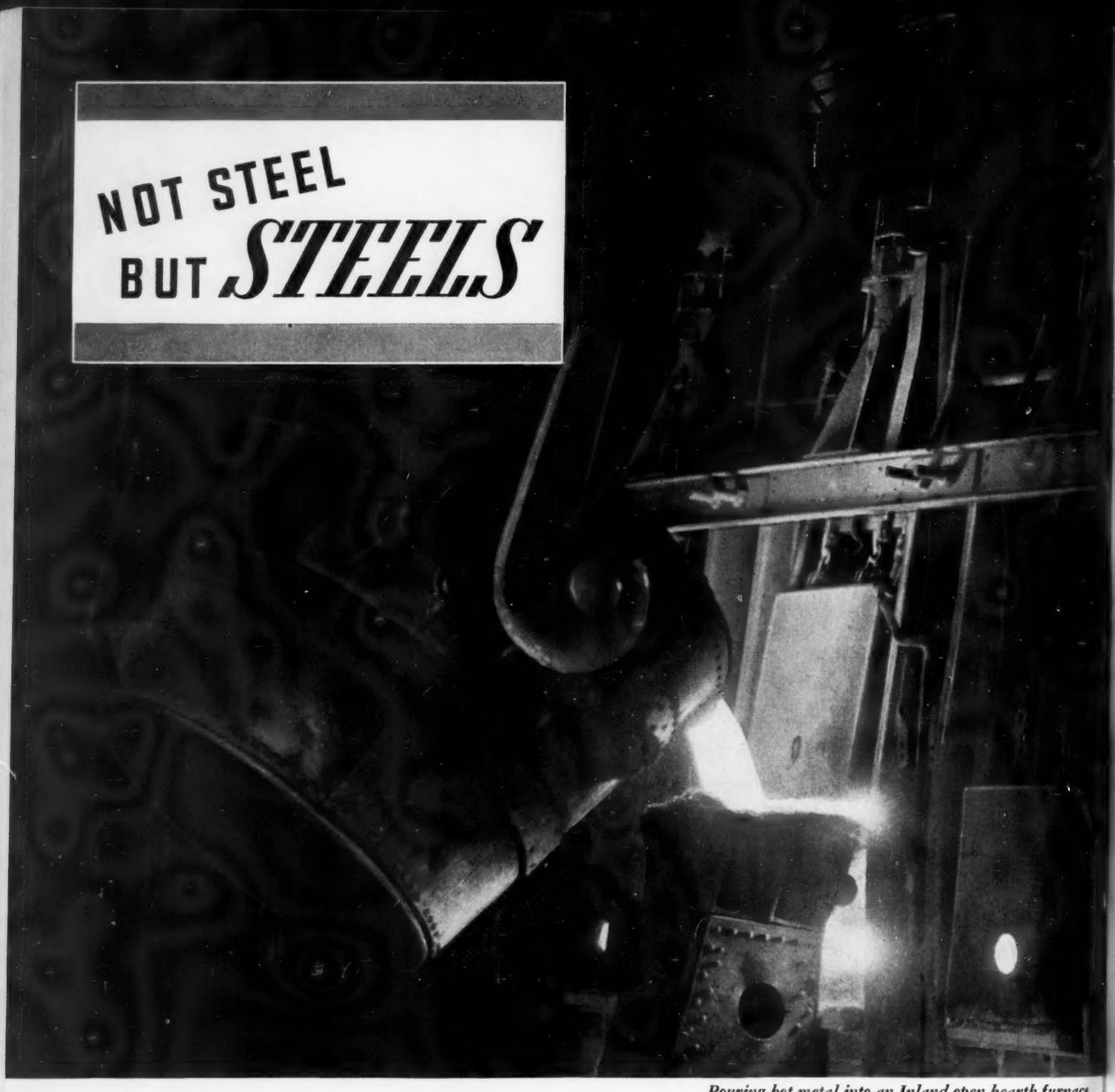
Here is an interesting materials handling problem: A manufacturer desires a conveying system to handle three different materials. Each material must be kept separate from the others. All are to be collected at various points in the plant and distributed, according to kind, in three bins. Ordinarily one would say that this condition calls for three separate conveying installations, but an automobile manufacturer, confronted with this problem in one of its Indiana plants, found a satisfactory and economical solution in a single, automatic conveyor. A combination of elevators, hoppers and a basket conveyor, with lugs on the conveyor baskets to permit automatic selectivity of materials (p. 55), does the trick. Applied to steel scrap in this instance, the idea has possibilities in other directions.

• • •

**Steel for New Store Fronts**

Encouraged by experience in repairing blast furnace stoves by welding, a British steel company fabricated a complete stove by the welding process (p. 65), and it has been operating satisfactorily for more than a year. Incidentally, some of the ore used in this district (p. 67) averages as low as from 23 to 25 per cent iron content. . . . That a recent survey of 1,500,000 stores showed that 90 per cent needed new fronts (p. 62) lends importance to store fronts as a market for steel. Porcelain enamel has made strides in this field and stainless steel also has made headway. . . . Read three sentences of the address (p. 60) made by Andrew Mellon at the dedication of the Mellon Institute of Industrial Research. The second sentence will make you think.

E. L. Shaner




*Pouring hot metal into an Inland open hearth furnace*

Today Inland's product is not *steel* but *steels*. For every heat that passes through the mill is checked to definite specifications. Elements are added; processes are altered. The customer finds that through Inland's well co-ordinated organization he is able to get better steel for his particular purpose. So much may be saved by securing a steel *exactly* suited to your particular needs —that we urge you to take advantage of Inland metallurgical cooperation.

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# 60,000 Steelworkers Back; Green Tells Why CIO Lost Strike

SIXTY-THOUSAND steelworkers, or 80 per cent of the 75,000 made idle by the strike, were back at work at the close of last week.

A break-down of the number who had returned was: Republic Steel Corp., plants 23,000; Youngstown Sheet & Tube Co.'s Youngstown district, 13,500; Bethlehem Steel Co.'s Cambria works, Johnstown Pa., 11,000; and Inland Steel Co., 12,500.

At Cleveland, 4150 were back at Republic's four divisions, including 2180 at the Corrigan-McKinney steelworks; 939 at Upson Nut works; 708 at Truscon; 323 at Steel & Tubes.

Steel was poured at Corrigan-McKinney Thursday night, for the first time in 44 days. At this plant 6 of the 14 open hearths were operating on Friday, with preparations for four more Saturday, and another early this week. Two of the four blast furnaces were in operation, one more to go in this week.

Steelworks operations for the entire industry at midweek stood at approximately 78 per cent, compared with 91½ per cent in the week ended May 22, just before the strike. Some of Republic's plants were operated through the July Fourth holidays, but general observance of the day reduced the national steelworks operating average for the week 3½ points to 74 per cent.

**Troops To Be Reduced**

State militiamen still stood guard at plants in the Mahoning valley, but preparations were being made to reduce the number. Others remain posted at Republic's four Cleveland divisions. At Youngstown 200 strikers and sympathizers were indicted by the grand jury for acts of violence.

The cost of the strike in loss of wages by steelworkers to date is estimated at $15,000,000; the individual loss has averaged about $210.

"It now becomes certain that the steel strikes at Chicago, Cleveland, Johnstown, Youngstown, Canton and other cities are lost," said William Green, president American Federation of Labor, in a statement last week.

"That means that the Committee for Industrial Organization failed to meet its first major test successfully.

"The hosts of labor are truly sorry because of the failure of the costly experiment and its tragic outcome. They regret that thousands of workers were persuaded to sacrifice themselves as victims of ill-advised and untimely strikes. Resentment and disappointment among these workers is bound to follow.

"The query is, What steps will now be taken by the one who formulates the policies of the CIO. He ordered those employed in the mines of the independent steel companies to strike in sympathy with the steel workers. Those workers are idle

## *They Want To Work!*

*Given protection by state troops and police, a steady stream of steelworkers filed into Republic's Corrigan-McKinney plant, Cleveland. Three hundred had to be turned away Friday because the bar mill was not yet ready for operation. Open-hearth steel was poured for the first time in 44 days. Acme Photo*

now for the alleged purpose of preventing the independent steel companies from securing coal.

"Now that the steel mills are in operation, will he call out on strike those mine workers who are employed at mines where the steel companies will now buy their fuel supply?

"He is now confronted with the problem of carrying out his threat to call miners on strike who are working under contract in mines where coal will be mined and shipped to independent steel companies or directing those employed at mines owned by said independent steel companies back to work, defeated and demoralized.

**Cites Causes of Defeat**

"There are two outstanding reasons why the strikes were lost.

"First, because only a minority of steel workers employed at the plants involved were organized when the strikes were called. Apparently, the CIO leaders are strong for minority action and minority control. They sought to win a major battle with only a corporal's guard in action.

"The CIO was not defeated because the small number of victims who participated in the strike lacked heroism or courage but simply because the overwhelming majority of the steel workers refused to join the CIO and participate in the strike. The essential requirement of a strong and complete organization of workers, preliminary to the calling of a strike, was completely ignored.

"Second, public opinion was aroused because of the violent policies pursued by the CIO in automobile and steel during the past year. It became openly hostile. Here, again, the power and force of public opinion is emphasized.

"The leaders of the CIO may as well make up their minds that they can not win strikes against which public opinion sets itself. The reaction of public opinion against the CIO and CIO methods is reflected in the creation of vigilante organizations in different cities, in the enactment of legislation such as the new labor relations act in Michigan, and the threat of repressive legislation in other states, as well as in congress."

In a press conference last Friday, President Roosevelt stated that he will call a conference of the governors of the steel strike states.

## *At Chicago*

The steel strike movement in Chicago, which began to disintegrate a week ago, now is almost in a state of collapse.

Inland Steel Co.'s works at Indiana Harbor has 30 open hearths active, of its total of 31 units. Its finishing mills are running at capacity.

Youngstown Sheet & Tube Co. last week resumed blast on two former Iroquois furnaces at South Chicago. Its Indiana Harbor plant, however, is entirely idle with CIO pickets at the gates. Gov. Townsend of Indiana, working through his labor commissioner, Thomas F. Hutson, is trying to effect some sort of arrangement with the Sheet & Tube officials which will lead to the re-opening of this, the last idle "struck" plant in this district.

The governor asked for "48 hours" by the Sheet & Tube employes' independent union, known as the Association of Steel Employes at the Indiana Harbor plant, when he hoped to find some sort of settlement. He asked that they "withhold any action," since they had wired him for protection while they returned to work. The 48-hour limit expired Thursday.

Republic Steel Corp.'s East Chicago plant was operating at 75 to 80 per cent.

**Board Hearing Testimony**

Meanwhile, in the hearing before Examiner Wood, the national labor relations board is taking testimony from strikers in its complaint of "unfair labor practices" against Inland. The company's attorneys walked out when Wood ordered their stenographer to cease taking notes on arguments involving testimony that Wood already had ruled against.

Last week, however, they returned when Wood read instructions from Chief Examiner Wolf at Washington, allowing notes to be taken of all the proceedings, but holding the portions objected to by Wood be regarded as "off the record" material.

It was announced by Wood on the day the attorneys walked out that "the only thing we are concerned with here is a signed agreement." He ruled out all testimony on the irresponsibility of CIO and SWOC, and also on wage and hour agreements.

Four iron ore mines of the International Harvester Co. on the Mesabi range were closed last Friday by the company following the blockading of ingress highways by CIO automobiles led by Congressman Bernard, farm-laborite, and commissioned by John L. Lewis to organize the miners. As loyal miners could not get to work, the company decided to close the mines for an indefinite period.

## *At Johnstown*

Officials of Bethlehem Steel Co.'s Johnstown plant asserted operations were "back to normal" last week.

It was unofficially estimated that more than 11,000 out of more than 15,000 persons normally employed in

### Steelworkers Welcome End of Strike

*THANKFULLY, joyously, men returned to Republic Steel Corp.'s Cleveland steelworks—last stronghold of the CIO's militant picket lines in Ohio. It was though a long siege of hard luck had ended, when state guardsmen and police were stationed at the plant to protect those who wished to return. A trip through the plant by a representative of* STEEL *revealed a spirit of glad relief that the strike was over. Cleveland News photo*

the plant had returned to work. It was unofficially estimated that only around 4000 persons were actually on strike at the height of the CIO walkout.

Pennsylvania state police reduced their force at the plant gates after several days of quiet.

Three Beaver Falls, Pa., plants, Moltrup Steel Products Co., Union Drawn Steel Co. and Ideal Machinery & Foundry Co., were operating at close to normal last week. Marching through CIO picket lines, about 150 workers returned to the Moltrup plant last Wednesday and more followed on succeeding days.

**Governor Addresses Rally**

Addressing a crowd of about 10,000 persons in Johnstown on the Fourth of July, Gov. George H. Earle of Pennsylvania said, "You don't need violence when you have a man like President Roosevelt in Washington, when you have a liberal congress and a governor like me in Pennsylvania who respect the workers' rights."

Governor Earle ordered Attorney General C. J. Margiotti of Pennsylvania to confer with Attorney General Homer Cummings in Washington on the legality of forcing an election in Bethlehem's Johnstown plant, either under the Wagner act or the state's "Little Wagner Law."

## Ingot Capacity Up 289,500 Tons

ANNUAL steel ingot capacity in the United States has increased 289,500 gross tons since Dec. 31, according to the American Iron and Steel institute. Capacity is now rated at 69,534,194 tons.

Capacity of blast furnaces increased from 49,604,737 gross tons to 49,819,737 tons.

The new figures reflect principally installations of new facilities and enlargement of others, but also correct certain discrepancies between former estimated capacity and actual production in some plants. The institute is basing regular reports on the new figures as of July 1.

Current ingot capacity figures for various processes are: Open hearth, 62,160,362 tons; bessemer, 6,325,000; electric, 1,038,252; crucible, 10,580.

## Republic To Expand Gulf States Capacity

Republic Steel Corp., Clevelarad, has announced an expansion program for its Gulf States Steel division, Gadsden, Ala., to cost about $2,000,000. Two 125-ton open-hearth furnaces will be added, increasing capacity of this department 50 per cent. These will cost $750,000. Contract for an addition to the open-hearth building has been awarded to Nashville Bridge Co., Nashville, Tenn., at $150,000. Sheet mill capacity will be expanded 50 per cent at cost of $1,000,000. Construction is to be started immediately.

Morgan Engineering Co. and Alliance Machine Co., both of Alliance, O., have been given contracts for cranes and machinery totaling about $200,000, including two 110-ton ladle cranes, a 75-ton charging crane, a charging machine and facilities for stripping and handling ingot molds.

## Two Birmingham Blast Furnaces Sold for Scrap

Purchase of two discarded blast furnaces on Vanderbilt road, Birmingham, from Woodward Iron Co., and resale of both for scrap was announced last week by George Mattison Jr., president of Woodstock Slag Co., Birmingham. The two furnaces are expected to yield approximately 5000 tons of scrap. No. 1 furnace was built in the early 1880's and has not been in operation since 1919. No. 2 was built in 1907 and has been inactive since 1926.

# *Inland Tells Employes Terms Under Which They Return*

TO AVOID misunderstanding terms under which Inland Steel Co. employes returned to work, the company, through Wilfred Sykes, assistant to the president, last week carefully explained to them "what happened" just before the strike was called off. The terms, following the numerals 1, 2 and 3 are the same as those published in STEEL July 5, p. 25.

A copy of the following statement was handed to each employe:

TO THE EMPLOYES OF INLAND STEEL CO.

Now that you are back at work we want you to know exactly what happened.

The facts are simple and clear, and are as follows:

*First:* We have stood squarely behind the statement of labor policy we gave you on May 25, 1937.

*Second:* We have made no agreement with the SWOC.

We have complied with the request of every public authority for full information about the strike.

We met continuously for nearly a week with the members of the steel mediation board appointed by the President, and explained our position. That board has since adjourned.

The entire question of the strike has been placed before the national labor relations board. Those hearings are now being conducted. Eventually either by the decision of that board or by the courts to whom appeal may be made, we shall all know what the law requires.

**Governor Given Assurances**

On Friday, June 25, Governor Townsend of Indiana asked us to talk to him. We did so, and explained our position to him in full. We gave him a copy of the statement of labor policy which we had sent to you, with a letter explaining our position in the strike.

On Tuesday evening by telephone the governor asked us to give him certain assurances regarding our labor policy, which we did. The exact language was as follows:

1—The men will be returned to work without discrimination between strikers and non-strikers.

2—Positive assurance that the labor policy as set forth by the Inland Steel Co. in their letter to the governor of June 26, 1937, and statement as to labor policy attached thereto, dated May 25, 1937, will be carried out.

3—All grievances which may hereafter arise on labor matters within the scope of the statement dated May 25, 1937, will be settled in the manner outlined in that statement. If any such settlement, so arrived at, is unsatisfactory, the company will refer the matter to the commissioner of labor of the state of Indiana, and will accept his decision as final.

We then announced that our plants would reopen and that we expected the public authorities of Indiana to maintain order. Thereafter we made no change in our position.

At 11 p. m. Wednesday, June 30, Governor Townsend, by telephone, made to us the simple announcement that the pickets would be withdrawn.

This is the full story on how the strike was terminated, and we are very happy that the plant has resumed normal operation without violence.

WILFRED SYKES, *Assistant to President, Inland Steel Co.*

# Important Automotive Industrial Center Developing in New Jersey

NEW Jersey is becoming the home of an increasingly important group of automotive industries.

Since the opening of the assembly unit of the General Motors Corp. at Linden, N. J., several additional new plants to be erected in other nearby communities have been announced. This indicates a new eastern automotive manufacturing center is in the making.

Two new projects, upon which construction work will be started soon, are a large branch plant for the Ternstedt manufacturing division of General Motors Corp. (STEEL, June 21, p. 26), and an eastern service plant for the Inland manufacturing division of the same company.

The Inland plant will be built in Clark township, south of Cranford, N. J., on the main line of the Lehigh Valley railroad.

These two new units, when completed, will bring to a total of six the General Motors branch plants in the New Jersey area. The four already established include the Hyatt Roller Bearing Co., Harrison, N. J., and the Delco-Remy battery plant and Chevrolet Export Boxing plant, both at Bloomfield. In the latter is located also a General Motors parts branch plant.

**Town Changes Its Name**

Vincent Bendix, president, the Bendix Aviation Corp., announced last week construction would start immediately on a large plant which his company will occupy at Bendix, N. J. The town, formerly known as Teterboro, recently changed its name to honor the corporation.

This plant will occupy 100 acres on a 500-acre site which have been acquired. The flying field, established for several years, will continue to occupy the additional Bendix acreage. Contract calls for completion of the major portion of the plant by November. There will be 10 buildings.

At Trenton, the new eastern branch plant of the L. A. Young Spring & Wire Corp., Detroit, is rapidly approaching completion.

Already the movement towards establishing an automotive center in this section has reacted favorably on general business activity in communities where new plants are located. For example, the Linden division at its peak will employ 2000 persons. The Ternstedt plant will provide employment for approximately 3000 men and women. Bendix employment, it is estimated, will be close to 2500. From 200 to 300 will find jobs in the Inland division plant.

What these developments mean to communities is well illustrated in Linden. In 1934 an industrial relations committee was appointed to bring industries and city officials into closer relationship, to study mutual problems and by active cooperation to reduce the municipal relief load by creating employment. Largely through the efforts of the committee, Linden today is a thriving industrial community.

Its population has increased fivefold since 1920 and it is anticipated this expansion will be equaled in the next decade. Importance of these changes to railroads is indicated by the fact the Central Railroad of New Jersey has been constructing a new freight spur from its shore line to serve Linden industries. Pennsylvania railroad recently acquired land and extended its trackage near the new General Motors plant.

All this has come about largely by reason of the movement towards expansion of the automotive industry. Back of this decentralization lies a philosophy expressed in the following statement by Alfred P. Sloan Jr., chairman, General Motors Corp.:

"The segregation of our industrial units into logical component parts strategically distributed among a greater number of communities, means a lower cost of living, more efficient production and, more important still, a more satisfactory and less artificial type of living for the workers. It means more communities more self-contained with better balanced economies—a reduced burden on the national economy in times of stress—a real step forward in integrating industry with the social structure of the nation to the benefit and protection of all."

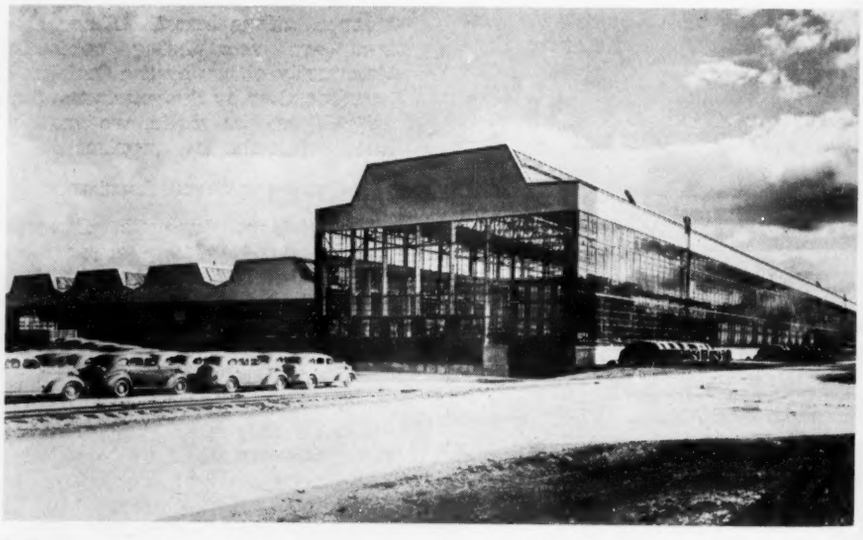
## Ford Plans $500,000 Expansion at Norfolk, Va.

Ford Motor Co. has announced a $500,000 expansion of the tidewater branch assembly plant at Norfolk, Va. The extension will be of reinforced concrete, structural steel, brick and steel sash. Almost doubling the size of the plant, the addition will be 300 x 520 feet and will include a 400-foot concrete dock extending into the Elizabeth river.

Employment for 250 more workmen will be provided and the plants capacity will be increased by 50 cars to 400 cars daily.

It will also provide facilities for handling parts and other material shipped from the Ford Rouge plant. Parts will be shipped in Ford vessels over the Great Lake through the New York barge canal, Hudson river and Atlantic coastal waters. At present the Norfolk plant has no facilities for receiving or dispatching shipments by water.

### Prize-Winning Industrial Building



*FIRST prize medal for the best executed example of the use of glass in industrial buildings during the past year, has been awarded Albert Kahn Inc., Detroit, for architectural work on the press plant of the new DeSoto plant in Detroit. Over 650 entries were received in the contest sponsored by Architectural Forum. About 40,000 panes of glass are used in this building, most of double-strength window variety, although roofing glass is of the hammered-wire type. Total glass area is 90,000 square feet, or 52 per cent of the wall and ceiling area*

# Production

OBSERVANCE of the Fourth of July brought the average steel operating rate for the week down 3½ points, to 74 per cent. However, with plants resuming production following collapse of the strike, the rate at midweek was probably at least 78 per cent, with indications of a better figure this week.

**Cleveland**—Drop of 2 points to 47 per cent was caused by shutdowns for the Fourth of July. Resumption of production following the strike has not had any effect this early.

**Central eastern seaboard**—One plant down for vacation was nearly balanced by increased production elsewhere. Operations were down 1 point to 65 per cent with prospects of increase this week.

**New England**—Off 12 points to 80 per cent because of minor repairs and the holiday. Advance to 90 per cent expected this week.

**Pittsburgh** — Holiday shutdown and vacation in two plants cut the operating rate to 67 per cent. Johnstown, Pa., plants are said to be back at normal.

**Wheeling**—Operations were down to 77 per cent for last week, owing to the holiday interruption.

**Cincinnati**—Operations continued at 93 per cent last week, the holiday having no effect.

**Detroit**—Down 5 points to 95 per cent as an open hearth is being relined and will be down until the middle of this week.

**Buffalo**—Lighting of an additional blast furnace stack raised rate to 88 per cent with probability of this continuing until repairs become necessary later in month.

**Chicago**—Resumption of production by plants affected by strike raised operations 6½ points to 70 per cent. Inland Steel Co. has 30 out of 31 open hearths operating and Republic Steel Corp. is operating six out of eight at East Chicago. Carnegie-Illinois Steel Corp. was at 67 per cent of capacity against 80 the preceding week, due to the holiday. Inland and Republic did not observe the Fourth. Youngstown Sheet & Tube Co. has resumed blast on its two stacks at Chicago.

**Youngstown** — Operations last week rose one point to 76 per cent, with 66 of 83 open hearths active. The rate is expected to rise to 78 per cent next week as Republic adds an open hearth at Warren, O.

Schedules for next week call for nearly 80 per cent operations, a better rate than has prevailed since the latter part of May and one of the best early July operating rates in the history of the district.

## District Steel Rate

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

| | Week ended July 10 | Change | Same week 1936 | Same week 1935 |
|---|---|---|---|---|
| Pittsburgh .. | 67 | —13 | 64 | 34 |
| Chicago ..... | 70 | +6½ | 71 | 42½ |
| Eastern Pa... | 65 | —1 | 49 | 26½ |
| Youngstown . | 76 | +1 | 74 | 43 |
| Wheeling ... | 77 | —15 | 69 | 62 |
| Cleveland ... | 47 | —2 | 84½ | 44 |
| Buffalo ..... | 87 | none | 86 | 26 |
| Birmingham . | 96 | +13 | 52 | 30 |
| New England | 86 | —6 | 68 | 41 |
| Detroit ..... | 95 | —5 | 100 | 94 |
| Cincinnati ... | 93 | none | 80 | † |
| St. Louis .... | 93 | none | † | † |
| Average .. | 74 | —3½ | 69½ | 38 |

†Not reported.

## Donora Plant Reopened After Vacation Period

The open hearth, blooming mill and three rod mills of the American Steel & Wire Co.'s Donora, Pa., plant reopened last week after one week's shutdown, during which approximately 1100 employes were given a week's vacation with pay.

Repairs were made to the three divisions during the closing. The zinc works, wire mill and blast furnace continued to operate.

The company offers a week's vacation to all employes having five years or more service. Approximately two-thirds are eligible.

# Strikes Cut June Ingots 19 Per Cent

HAD the steel strike interruption come one week later, production of steel ingots for first half would have established an all-time record, exceeding that of the first half of 1929, which stands as the best performance up to this time.

As it was, first-half production failed by less than 1 per cent of equaling the 1929 record. Total production for first half this year was 28,764,633 gross tons, compared with 29,036,274 tons in the corresponding period of 1929. The difference in favor of the latter is 271,641 tons, less than a week's output at the 1937 rate. Production in the first half of 1937 was almost four times the 7,697,210 tons made in first six months of 1932.

The drop came in the June production, which totaled 4,183,762 tons, almost 19 per cent below the 5,153,559 tons made in May. Steelworks operated at 74.46 per cent of capacity in June, compared with 88.82 per cent in May. The loss from May to June, directly attributable to strike interference, was close to 1,000,000 tons.

The June output was only 5 per cent greater than that of June, 1936, but the six-month total was 35 per cent above the 21,276,097 tons made in the corresponding period of 1936.

## Steel Ingot Statistics

Monthly Production—Complete for Bessemer; Open Hearth, Calculated from Reports of Companies Making 98.03 per cent

| 1937 | —Open Hearth— Gross tons | Per cent of capacity | —Bessemer— Gross tons | Per cent of capacity | — Total — Gross tons | Per cent of capacity | Weekly production, all companies, gross tons | Number of weeks in month |
|---|---|---|---|---|---|---|---|---|
| Jan..... | 4,433,145 | 84.20 | 291,794 | 54.30 | 4,724,939 | 81.43 | 1,066,578 | 4.43 |
| Feb..... | 4,082,163 | 85.87 | 331,669 | 68.35 | 4,413,832 | 84.25 | 1,103,458 | 4.00 |
| March..... | 4,812,879 | 91.42 | 403,787 | 75.14 | 5,216,666 | 89.91 | 1,177,577 | 4.43 |
| April..... | 4,681,677 | 91.83 | 390,198 | 74.98 | 5,071,875 | 90.27 | 1,182,255 | 4.29 |
| May ..... | 4,767,269 | 90.55 | 386,290 | 71.88 | 5,153,559 | 88.82 | 1,163,332 | 4.43 |
| June ..... | 3,899,190 | 76.48 | 284,572 | 54.68 | 4,183,762 | 74.46 | 975,236 | 4.29 |
| 6 mos. .. | 26,676,323 | 86.77 | 2,088,310 | 66.54 | 28,764,633 | 84.89 | 1,111,891 | 25.87 |
| 1936 | | | | | | | | |
| Jan..... | 2,843,415 | 54.76 | 196,389 | 32.21 | 3,039,804 | 52.39 | 686,186 | 4.43 |
| Feb..... | 2,754,446 | 56.76 | 202,445 | 35.55 | 2,956,891 | 54.53 | 714,225 | 4.14 |
| March..... | 3,148,813 | 60.64 | 185,040 | 30.33 | 3,333,853 | 57.46 | 752,563 | 4.43 |
| April..... | 3,627,830 | 72.14 | 304,775 | 51.62 | 3,932,605 | 69.99 | 914,593 | 4.29 |
| May..... | 3,735.283 | 71.93 | 302,092 | 49,55 | 4,037,375 | 69.58 | 911,371 | 4.43 |
| June ..... | 3,640,672 | 72.40 | 334,897 | 56.72 | 3,975,569 | 70.75 | 926,706 | 4.29 |
| 6 mos. .. | 19,750,459 | 64.78 | 1,525,638 | 42.62 | 21,276,097 | 62.45 | 817,966 | 26.01 |
| July..... | 3,587,764 | 69.25 | 326,606 | 53.69 | 3,914,370 | 67.61 | 885,604 | 4.42 |
| Aug..... | 3,833,727 | 73.83 | 350,560 | 57.50 | 4,184,287 | 72.11 | 944,534 | 4.43 |
| Sept..... | 3,848,340 | 76.71 | 303,048 | 51.45 | 4,151,388 | 74.05 | 969,950 | 4.28 |
| Oct..... | 4,216,536 | 81.20 | 317,710 | 52.11 | 4,534,246 | 78.15 | 1,023,532 | 4.43 |
| Nov..... | 3,993,472 | 79.42 | 329,353 | 55.82 | 4,323,025 | 76.94 | 1,007,698 | 4.29 |
| Dec..... | 4,119,025 | 79.50 | 305,342 | 50.20 | 4,424,367 | 76.42 | 1,000,988 | 4.42 |
| Total....43,349,323 | | 70.74 | 3,458,457 | 48.07 | 46,807,780 | 68.36 | 895,329 | 52.28 |

Percentages of capacity for 1937 are calculated on weekly capacities of 1,188,432 gross tons for open-hearth ingots, 121,308 tons for bessemer and 1,309,760 tons total, based on annual capacities as of Dec. 31, 1936, as follows: Open-hearth ingots, 61,965,862 gross tons; bessemer, 6,325,000 tons; for 1936, on weekly capacities of 1,172,160 gross tons open-hearth ingots, 137,624 tons bessemer, 1,309,784 tons total, based on annual capacities as of Dec. 31, 1935, as follows: Open-hearth ingots 61,280,509 gross tons, bessemer 7,195,000 gross tons.

# Steel, Scrap Exports Set New Records

FINISHED and semifinished steel and iron exports in May probably established a post-war record, and scrap exports made an all-time record, according to the metals and minerals division of the department of commerce.

May tonnage in both classes fell little short of total exports for the first five months of 1936.

Exports of finished and semifinished products totaled 405,810 gross tons in May, valued at $19,186,363, compared with 255,788 tons in April, valued at $15,854,933. In May, 1936, the total was 97,511 tons valued at $7,387,862. The May figures represent an increase of 54.5 per cent in volume and 21 per cent in value compared with April and 316 per cent in quantity and 160 per cent in value compared with May, 1936.

Pig iron and steel ingots registered a sharp gain in May, indicating the strong demand from abroad. The gain in these two items alone was sufficient to account for the sharp increase of total exports over April. Exports of pig iron totaled 117,598 tons in May, compared with 38,177 tons in April and 121 tons in May, 1936. Steel ingots, blooms and other semifinished steel were exported to a total of 99,551 tons, compared with 5495 tons in April and 982 tons in May, 1936.

In five months this year finished and semifinished exports aggregated 1,138,492 tons, valued at $67,989,315, compared with 450,859 tons valued at $33,834,799, an increase of 148 per cent in volume and 101 per cent in value over the corresponding period of 1936. The tonnage in May, 405,810 tons, was only about 40,000 tons lower than the total for five months last year.

Scrap exports reached the record total of 637,679 tons in May, compared with 427,886 tons in April and 217,439 tons in May, 1936. For five months scrap exports totaled 1,651,934 tons, against 880,855 tons in five months of 1936. The May exports were 72 per cent of the five-month aggregate in 1936.

**UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS**

**Gross Tons**

| Articles | May 1937 | April 1937 | Jan. thru May '37 |
|---|---|---|---|
| Pig iron | 117,598 | 38,177 | 200,657 |
| Ferromanganese and spiegeleisen | 16 | 1,076 | 1,242 |
| Other ferroalloys | 254 | 60 | 875 |
| *Ingots, blooms, etc.: | | | |
| Not cont. alloy | 99,215 | 5,216 | 116,586 |
| Alloy incl. stainless | 336 | 279 | 1,247 |
| Bars, iron | 571 | 114 | 1,148 |
| Bars, concrete | 2,100 | 2,181 | 6,803 |
| *Other steel bars: | | | |
| Not cont. alloy | 9,976 | 9,885 | 38,938 |
| Stainless steel | 8 | 7 | 81 |
| Alloy, not st'nless | 870 | 616 | 2,916 |
| Wire rods | 5,872 | 6,508 | 20,396 |
| Boiler plate | 430 | 519 | 1,599 |
| *Other plate, not fab.: | | | |
| Not cont. alloy | 24,881 | 25,785 | 95,644 |
| Stainless steel | 5 | ... | 16 |
| Alloy, not st'nless | 852 | 1,104 | 2,163 |
| Skelp | 10,084 | 11,181 | 31,537 |
| Sheets, galv. iron | 516 | 437 | 2,572 |
| Sheets, galv. steel | 5,162 | 7,261 | 27,094 |
| *Sheets, black steel: | | | |
| Not cont. alloy | 22,570 | 29,220 | 96,512 |
| Stainless steel | 79 | 47 | 265 |
| Alloy, not st'nless | 1,098 | 60 | 1,239 |
| Sheets, black iron | 560 | 1,238 | 3,605 |
| *Strip steel, cold-rolled: | | | |
| Not cont. alloy | 2,278 | 2,311 | 12,140 |
| Stainless steel | 44 | 50 | 184 |
| Alloy, not st'nless | 36 | 46 | 272 |
| *Strip steel, hot-rolled: | | | |
| Not cont. alloy | 5,712 | 16,228 | 37,631 |
| Stainless steel | ... | 31 | 95 |
| Alloy, not st'nless | 7 | 11 | 248 |
| Tin plate, taggers' tin | 28,380 | 30,289 | 126,417 |
| Terne plate | 498 | 378 | 2,775 |
| Tanks, except lined | 3,074 | 2,543 | 11,908 |
| Shapes, not fab. | 8,677 | 12,179 | 48,081 |
| Shapes, fabricated | 3,082 | 2,070 | 13,867 |
| Plates, fabricated | 684 | 4,121 | 8,632 |
| Metal lath | 304 | 221 | 932 |
| Frames and sashes | 53 | 47 | 308 |
| Sheet piling | 175 | 127 | 2,050 |
| Rails, 60 lb. | 8,066 | 3,995 | 32,182 |
| Rails, under 60 lb. | 1,346 | 843 | 4,914 |
| †Rails, relaying | 74 | 5,502 | 10,175 |
| Rail fastenings | 1,112 | 1,436 | 4,479 |
| Switches, frogs, etc. | 267 | 297 | 926 |
| Railroad spikes | 508 | 225 | 1,300 |
| R. R. bolts, nuts, etc. | 156 | 38 | 401 |
| Boiler tubes, s'mless | 1,356 | 894 | 5,043 |
| Do. welded | 41 | 10 | 216 |
| Pipe: | | | |
| Smls. casing oil line | 5,914 | 6,276 | 30,962 |
| Do. Welded | 117 | 441 | 3,534 |
| Do. Smls. black | 926 | 1,046 | 5,862 |
| Pipe fittings: | | | |
| Mall. iron screwed | 664 | 411 | 2,088 |
| Cast iron screwed | 264 | 312 | 1,281 |
| Pipe, fittings for: | | | |
| Cast-iron pressure | 2,335 | 2,248 | 10,995 |
| Cast-iron soil | 1,284 | 690 | 3,925 |
| Pipe—welded: | | | |
| Black steel | 2,369 | 1,802 | 8,812 |
| Bl'k wrought iron | 2,146 | 90 | 2,724 |
| Galv. steel | 1,845 | 1,318 | 7,923 |
| Galv. wrou't iron | 234 | 244 | 1,005 |
| Pipe and fittings: | | | |
| Rivtd. iron or steel | 101 | 47 | 271 |
| Wire: | | | |
| Plain iron or steel | 3,576 | 2,369 | 14,664 |
| Galvanized | 2,099 | 1,672 | 9,185 |
| Barbed | 3,778 | 3,000 | 16,172 |
| Woven wire fencing | 308 | 400 | 1,578 |
| *Woven wire screen: | | | |
| Insect | 64 | 49 | 193 |
| Other | 118 | 136 | 571 |
| ‡Wire rope | 416 | 480 | 2,236 |
| ‡Wire strand | 58 | 32 | 250 |
| †Card clothing | 3 | 21 | 30 |
| Other wire | 850 | 845 | 3,460 |
| Wire nails | 1,980 | 2,096 | 9,248 |
| Horseshoe nails | 78 | 65 | 383 |
| Tacks | 22 | 21 | 125 |
| Other nails, staples | 256 | 204 | 1,367 |
| Bolts, etc. | 1,321 | 1,005 | 4,921 |
| Castings: | | | |
| *Gray iron, semi-steel | 471 | 464 | 2,617 |
| Malleable iron | 531 | 544 | 2,417 |
| *Steel, not alloy | 226 | 183 | 894 |
| Alloy incl. stainless | 179 | 190 | 740 |
| Car wheels, tires, axles | 1,504 | 1,597 | 6,677 |
| Horseshoes, calks | 5 | 46 | 135 |
| *Forgings, n.e.s.: | | | |
| Not alloy | 671 | 552 | 2,548 |
| Alloy incl. st'nless | 114 | 29 | 383 |
| Total I. & S. prod. | 405,810 | 255,788 | 1,138,492 |
| Scrap, iron, steel | 630,671 | 421,383 | 1,620,114 |
| Scrap, tin plate | 2,598 | 1,869 | 7,695 |
| †Tin plate circles, strips, cobbles | 897 | 958 | 5,565 |
| Waste-waste tin plate | 3,613 | 3,676 | 18,560 |
| Total scrap | 637,679 | 427,886 | 1,651,934 |
| GRAND TOTAL | 1,043,489 | 683,674 | 2,790,426 |
| Iron ore | 212,475 | 78,609 | 293,878 |

*No comparisons available. †New class. ‡No distinction prior to 1936.

## U. S. Sells 61% of British Machine Tool Imports

Imports of machine tools into Great Britain continues at a high and increasing rate, 1937 promising to eclipse the two preceding years. The United States is by far the largest supplier, accounting for 61 per cent of machine tools imported during first quarter. Value of machine tool imports for first quarter was £1,504,172, of which the United States supplied £919,349, Germany £352,604 and Switzerland £65,375.

Preliminary statistics for four months indicate a value of £2,033,000 for machinery imports, which is 122 per cent greater than for the corresponding period of 1936.

## Machinery Exports Gain

Industrial machinery exports in May were valued at $21,795,768, compared with $13,559,054 in May, 1936. There was a decline of 4 per cent from April but a rise of 60 per cent from May of last year, according to the machinery division of the department of commerce.

Power-driven metalworking machinery exports in May were valued at $5,044,632, compared with $2,959,866 in May, 1936, a gain of about 70 per cent. Metalworking machinery other than power-driven dropped to $380,582 in May from $430,319 in May, 1936.

## Farrel-Birmingham Co. Honors Old Employes

Service pins were presented to 144 employes with 25 years or more service by Farrel-Birmingham Co., Ansonia, Conn., equipment makers, at a recent testimonial banquet. Of the 114 present employes who received the service pins, six had served 50 years or more, two from 45 to 49 years, ten from 40 to 44 years, 29 from 35 to 39 years, 23 from 30 to 34 years and 44 from 25 to 29 years. Retired are 30 employes with more than 25 years service, three of whom had served the company for more than 50 years.

Toastmaster at the banquet was Nelson W. Pickering, president. At the speakers' table were the 50-year veterans, Charles F. Bliss, former president, Franklin Farrel Jr., chairman, and James W. Hook, president, Geometric Tool Co., New Haven, Conn., and head of the New England council, who delivered the principal address.

Mr. Pickering pointed out that 18 per cent of the company's 800 employes of 1912 and 10 per cent of the 500 employes of 1900 were present at the banquet.

# 111 College Men In Bethlehem Class

BETHLEHEM STEEL CO. opened the largest college training class in its history July 7, as 111 June graduates from many sections of the country reported for work.

The size of this group is considered by the company as an indication of the revival of college graduate employment in the steel business to a degree not hitherto experienced since the depression.

The wide range of opportunity afforded in the steel business is indicated by the courses from which the new men have been selected. These include not only all phases of engineering, but also various phases of metallurgy, arts, business school training and even aeronautics, in which one man majored.

**How Course Is Organized**

Students start their work with a 4-weeks' lecture and laboratory period during which the men visit the various divisions of the Bethlehem plant, as well as the various executive departments, spending a limited amount of time in each general phase of the company's work to get an idea of production, selling, finance and administration.

Following this each student is assigned to one of several specialized training courses in accord with the type of work in which he has shown aptitude. These divisional courses vary in length of time depending upon the subject matter and circumstance.

In general, the Bethlehem Steel training course is similar in function to the course in "Freshman Problems" which is required in many colleges, being designed to orient and prepare the newcomer for his permanent future work by giving him a general panorama at the start.

"Until only a few years ago," commented E. G. Grace, Bethlehem's president, on the opening of the course, "the men entering the steel business gained their technical knowledge only through years of experience in the mills or in the offices. And there is still no substitute for experience, and never can be. Yet today through sound training in the classrooms and laboratories of colleges and universities, men are acquiring a fundamental knowledge of the problem which they will face in their chosen work.

"The requirements of the steel industry have broadened so in recent years as to increase the need for college training in its personnel."

The Bethlehem training school for college graduates is known throughout the company and in university circles as "the loop course," due to the fact that the men make a circuit of the various activities in the course of their training.

## Terne Standard Revised

Division of simplified practice of the national bureau of standards, Washington, has approved a revision of simplified practice recommendation R30 on roofing ternes and mailed copies to all interests for consideration and approval. The original recommendation, approved Jan. 1, 1925, provided seven weights of coating, from 8 to 40 pounds. The present revision adds a packing schedule for roofing ternes in boxes and rolls and a method of marking roofing in rolls.

## Government Expenditures Total $17,000,000,000

Total expenditures of all government units in the United States last year were approximately $17,000,000,000, according to the National Industrial Conference board. For the fiscal year 1935, the latest for which complete information is available, the total was $14,931,000,000, an increase of nearly $500,000,000 over 1934.

The conference board's new report, *Cost of Government in the United States*, 1934-1936, indicates federal expenditures increased $60,000,000 in 1935 over 1934; state expenditures increased $186,000,000; local expenditures increased $236,000,000. In 1936 federal expenditures increased by $1,732,000,000, chiefly as a result of soldiers' bonus payments amounting to $1,673,000,000.

Per capita governmental costs are estimated by the board at $117.09 for 1935, compared to $114.11 for 1934. During the period from 1923 to 1935, per capita costs increased each year with the exception of 1933. The increase for the period was almost 50 per cent.

## Air Conditioning Orders Nearly Double 1936

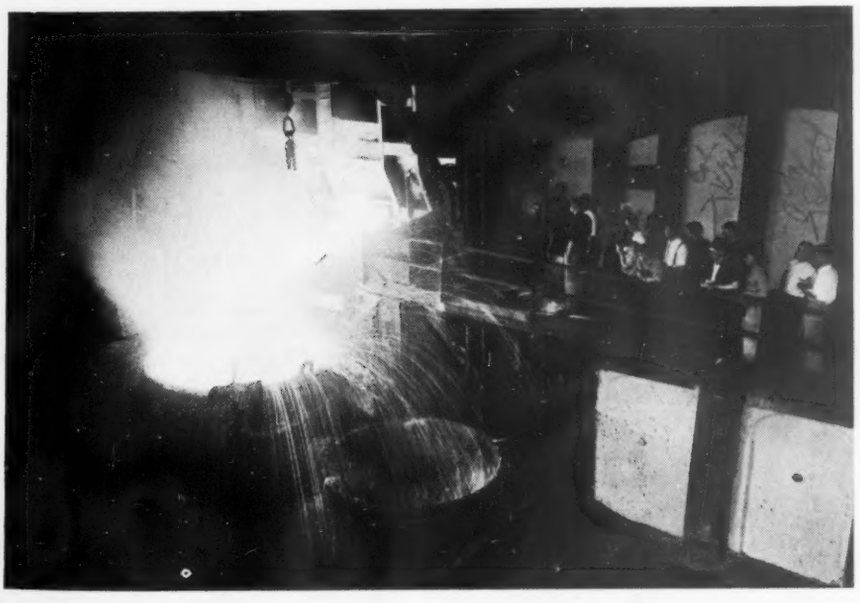
Air conditioning orders booked in May were valued at $6,472,804, compared with $6,538,431 in April and $4,650,681 in May, 1936, according to the commerce department. For five months ending in May orders totaled $31,420,627, against $16,703,669 for the five months of 1936.

## Belmont Iron Works Open After Six-Year Idleness

Belmont Iron Works, Philadelphia, will open its fabricating plant at Royersford, Pa., in the near future. This plant has been idle for approximately six years. At the outset, 150 men will be employed.

This is the second plant to be opened in eastern Pennsylvania. As announced in STEEL, July 5, the American Bridge Co. shortly will open its Trenton plant which has been closed for five years.

### June College Graduates Start in Steel Mills



*A NEW crop of "loopers," as they are called, because taking a special course that familiarizes them with all departments, watches the tapping of an open-hearth furnace at the Bethlehem plant of Bethlehem Steel Co. See accompanying article. Photo courtesy Bethlehem*

# Men of Industry

CHARLES L. HUSTON, first vice president, Lukens Steel Co., Coatesville, Pa., observed his eighty-first birthday Thursday, July 8. Mr. Huston is the company's oldest active employe, having joined it in 1875, following his graduation from Harvard college. He was made vice president and works manager of Lukens Iron & Steel Co. in 1897, and subsequently developed the three-high universal plate mill, the 206-inch four-high rolling mill, and other labor-saving improvements.

♦ ♦ ♦

George E. Smith, superintendent of melting and forging, Midvale Co., Nicetown, Philadelphia, has been made general superintendent.

♦ ♦ ♦

Paul Fielden, credit manager, Norton Co., Worcester, Mass., recently was elected president of the National Association of Credit Men.

♦ ♦ ♦

Frank T. Sheets has been named president of the Portland Cement association, effective Sept. 1. He succeeds Edward J. Mehren, resigned.

♦ ♦ ♦

Comfort E. Brown has been appointed general purchasing agent, and J. R. Lewis assistant purchasing agent of J. H. Weaver & Co., Philadelphia.

♦ ♦ ♦

J. R. Barnes, for many years associated with Valentine & Co. in the New England and New York territory, has joined the sales organization of Wilson & Bennett Mfg. Co., Chicago, maker of steel pails and drums.

♦ ♦ ♦

Victor M. Witmer, president, Milwaukee Structural Steel Co., has been inducted into the "Fifty-Year Club" of Rensselaer Polytechnic institute, Troy, N. Y., from which he graduated in 1887.

♦ ♦ ♦

I. W. Miller, formerly coal mining engineer with the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has been promoted to chief engineer of coal mines, succeeding W. A. Hamilton, resigned.

♦ ♦ ♦

W. R. Wuest has been elected president, Junkin Safety Appliance Corp., Louisville, Ky. He succeeds the late John C. Junkin. J. I. Junkin is vice president and J. H. Wuest, secretary-treasurer.

♦ ♦ ♦

Basssett Lerch has been transferred from the Chicago factory of Mercoid Corp., maker of automatic and mercury controls, to St. Louis, with headquarters at 8787 Bridgeport avenue. Russell MacDonald is now located in the Boston office of Mercoid, and Paul J. Provost, after taking the Mercoid training course, is now with the Philadelphia office.

♦ ♦ ♦

Arnold P. Yerkes, International Harvester Co., was elected president, American Association of Agricultural Engineers at the annual meeting held recently at the University of Illinois, Urbana, Ill.

♦ ♦ ♦

George M. Humphrey, president, M. A. Hanna Co., Cleveland, has been elected a director of Phelps-Dodge Corp., copper producing company. He is also a director and chairman of the executive committee of National Steel Corp.

George M. Humphrey

♦ ♦ ♦

William E. Blake, Carborundum Co., Niagara Falls, N. Y., has been elected president, Purchasing Agents Association of Buffalo. Bernard T. Loft, Bethlehem Steel Co., Lackawanna, N. Y., is the new vice president.

♦ ♦ ♦

James A. Gibbons has been added to the field sales organization of the Hancock valve division, Consolidated Ashcroft Hancock Co., Bridgeport, Conn. He will specialize on industrial power plant and public utility construction work.

♦ ♦ ♦

H. B. Allen, for 14 years New York district sales manager of Babcock & Wilcox Tube Co., has resigned to become vice president of John B. Astell & Co. Inc., 90 West Broadway, New York, distributor of Babcock & Wilcox tubular products.

♦ ♦ ♦

James L. Brown has been appointed vice president in charge of sales of Covered Wagon Co., Mt. Clemens, Mich., succeeding J. E. Roberts, resigned. Mr. Brown was formerly associated with General Motors Corp.

♦ ♦ ♦

W. H. Sadler, formerly with N. W. Ayer & Son Inc., advertising, has been appointed director of public relations of Edward G. Budd Mfg. Co., Philadelphia. Once director of public relations of the Kentucky Utilities Co., Mr. Sadler is a former newspaperman.

♦ ♦ ♦

Mitchell M. Frey Jr. has resigned as secretary-treasurer of Wm. B. Scaife & Sons Co., steel tank fabricator, Oakmont, Pa., after almost 48 years of continuous service, 21 as secretary-treasurer. Archie V. Murray was named to succeed Mr. Frey.

♦ ♦ ♦

H. M. Hempstead has been appointed director of advertising of the Hupp Motor Car Corp. He has been associated with the Delco-Frigidaire division of General Motors Corp., and previously was assistant sales promotion manager of Pontiac Motor Co.

♦ ♦ ♦

J. F. Blackie, executive vice president, National Enameling & Stamping Co., Milwaukee, has resigned to devote his time to travel and many personal interests. His connection with National Enameling began in 1924, when he started at the Granite City, Ill., factory.

♦ ♦ ♦

Joseph Hummel Jr., associated with Eagle-Picher Lead Co., Cincinnati, for 40 years, the past 12 as secretary-treasurer, has been elected president and treasurer, to succeed A. E. Bendelarie, resigned. Vincent H. Beckman has beeen elected secretary, and William R. Dice, comptroller and vice president.

♦ ♦ ♦

H. L. Buschman has been elected vice president in charge of manufacturing, and A. G. Hopkins, vice president in charge of equipment, National Can Co., subsidiary of McKeesport Tin Plate Corp., McKeesport, Pa. Both have been actively identified with National Can and its predecessor for many years.

♦ ♦ ♦

William Printz, 45 West Thirty-fourth street, New York, has been appointed sales manager for the eastern division of Wheelco Instruments Co., Chicago, maker of temperature indicating and control instruments. He has been connected with the temperature control instrument field 20 years.

♦ ♦ ♦

Fred E. Gore, vice president, Blue Diamond Coal Sales Co., and Robert W. Lea, president, West Virginia Coal & Coke Corp., were recently elected to the board of directors, Appalachian Coals Inc. Mr. Gore succeeds the late James M. Bonnyman

and Mr. Lea replaces John C. Cosgrove, resigned.

♦ ♦ ♦

Robert H. Fulton, Jr., Pittsburgh, has been elected secretary-treasurer of the Aluminum Goods Mfg. Co., Manitowoc, Wis., to succeed John F. Walton, Jr., who resigned Aug. 1 to become associated with the M. B. Suydam Co., Pittsburgh, manufacturer of paint and varnish. Mr. Fulton has been manager of sheet sales for the Aluminum Co. of America.

♦ ♦ ♦

George W. Brown recently succeeded Thomas S. Duncan, resigned, as purchasing agent of the H. C. Frick Coke Co., Pittsburgh. Mr. Brown began his career with National Tube Co., Pittsburgh, and joined the Frick Co. in 1921. Mr. Duncan came to the Frick Co. in 1902. M. S. Mawhinney has been promoted to assistant general purchasing agent.

♦ ♦ ♦

John E. Manning, formerly associated with Marshall & Fox, architects, and also Frank D. Chase Inc., Chicago, has been appointed western manager of Designers for Industry Inc., with headquarters in the Merchandise Mart, Chicago. He succeeds H. C. Gooding, recently named eastern manager, with offices in Rockefeller Center, New York.

♦ ♦ ♦

Walter Gerlinger, president, Walter Gerlinger Inc., representative of foundry equipment and supply manufacturers, has been elected president of the Milwaukee chapter, American Foundrymen's association. Roy M. Jacobs, president, Standard Brass Works, was elected vice president; William MacNeil, secretary, and W. J. Donnelly, Smith Steel Foundry Co., treasurer.

♦ ♦ ♦

W. H. Harrison, assistant vice president, department of engineering and operation, American Telephone & Telegraph Co., New York, has been elected president, American Institute of Electrical Engineers for the year beginning Aug. 1. Vice presidents elected are: I. Melville Stein, Philadelphia; Edwin D. Wood, Louisville, Ky.; L. N. McClellan, Denver; J. P. Jollyman, San Francisco and M. J. McHenry, Toronto, Ont.

♦ ♦ ♦

George T. Long, who has had wide experience in home heating and three years of residential air conditioning experience with Carrier Corp., Newark, N. J., has been placed in charge of the newly established residential air conditioning division of the company. Other additions to the design and application engineering staff of Carrier are Stanley Ellison and Donald Flynn, commercial refrigeration; E. L. Hinchliff, public utilities; Mortimer Lansing and C. R. Davison, portable summer air conditioner; E. D. Greiner and George Scheele, dealer development.

♦ ♦ ♦

R. M. Beatty has been appointed manager of range sales of Westinghouse Electric & Mfg. Co., Pittsburgh, with headquarters at Mansfield, O. Mr. Beatty succeeds J. D. Kelly, who has been transferred to New York.

L. F. A. Mitchell, formerly assistant manager of sales for Canadian Westinghouse Co., has been appointed head of the construction industry section of Westinghouse.

H. J. Mauderer was elected auditor of Westinghouse, with headquarters at 150 Broadway, New York. He has been assistant auditor since 1924, after joining the company in 1920.

**H. F. Boe**

Formerly eastern district manager, Westinghouse Electric & Mfg. Co., Pittsburgh, who has been appointed commercial manager, as noted in STEEL, June 5, page 32.

♦ ♦ ♦

Robert L. Sackett, for 22 years dean of the school of engineering, Pennsylvania State college, State College, Pa., retired July 1. He will devote his time to personal interests including executive and committee work in several technical societies. At present he is vice president, American Society of Mechanical Engineers. Among the organizations in which he heads important committees are the Engineering Council for Professional Development, American Society of Civil Engineers and American Engineering council.

♦ ♦ ♦

N. F. Melville has been appointed manager of manufacturers' wire, and stainless steel wire sales of Pittsburgh Steel Co., Pittsburgh. Mr. Melville attended Carnegie Institute of Technology and has been sales representative for Pittsburgh Steel since 1927, except for a period of about two years when he was chief metallurgist of Rotary Electric Steel Co., Detroit.

# Died:

WALTER CARY, 66, vice president, Westinghouse Electric & Mfg. Co., in New York, July 2. He became vice president of Westinghouse in 1917, after serving as president of Westinghouse Lamp Co. and of the Milwaukee Electrical Co., which he helped organize.

♦ ♦ ♦

Daniel Bell, 78, in Boston, June 30. Mr. Bell retired in 1924 as foreman of Dominion Coal Co., Glace Bay, Nova Scotia.

♦ ♦ ♦

William C. Kelley, 61, former superintendent at the Scottdale, Pa., plant of American Sheet & Tin Plate Co., in Pittsburgh, June 30.

♦ ♦ ♦

John Mordecai, superintendent of the wire division of the Sparrows Point plant of Bethlehem Steel Corp., in Baltimore July 3.

♦ ♦ ♦

Walter J. Phillips, chairman, Federal Supply Co. and Valley Supply Co., subsidiaries of Pittsburgh Coal Co., recently while en route to Wales.

♦ ♦ ♦

Frank G. Cornell, president of Chemung Foundry Corp., Elmira, N. Y., and director of Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y., in that city recently.

♦ ♦ ♦

Hugo E. Volckmann, 66, secretary-treasurer and one of the founders of the Village Blacksmith Folks, Watertown, Wis., manufacturer of cutlery, recently in Watertown.

♦ ♦ ♦

Charles P. Bossert, 74, associated with Milwaukee industries as a mechanical engineer until his retirement in 1928, June 28, in Milwaukee.

♦ ♦ ♦

C. E. Pipp, 73, president and general manager since 1911 of Angle Steel Tool Co., Plainwell, Mich., June 27. A. R. Pipp succeeds to the presidency.

♦ ♦ ♦

Frank Disston, 57, vice president, Henry Disston & Sons, saw manufacturers, Philadelphia, in St. David's, Philadelphia suburb, July 4. He was a grandson of the company's founder.

♦ ♦ ♦

Daniel Edward Moran, 73, consulting engineer, in Mendham, N. J., recently. He was identified with the construction of some of the world's largest bridges, including the George Washington, New York; the San Francisco-Oakland Bay, and the Golden Gate, San Francisco.

# Meetings

### PREPARE FOR INTERNATIONAL CONGRESS ON MANAGEMENT

SEVENTH International Management congress, bringing to the United States authorities on industrial and commercial management from about 40 countries will be held in Washington, Sept. 19-23. Lord Leverhulme of Great Britain is president of the congress. To sponsor the congress, the first to be held in the United States, an American Congress council was organized recently with Willis H. Booth, honorary president, International chamber of commerce, as chairman. The council's co-ordinating committee is headed by W. L. Batt, president, S K F Industries Inc., Philadelphia.

Organizations active in sponsorship of the congress include the American Management association, American Society of Mechanical Engineers, Association of Consulting Management Engineers, International City Managers' association, Life Office Management association, Personnel Research Federation, and Society for Advancement of Management.

The congress will consist of discussions of the latest developments in management, and the social and economic aspects of management, based on more than 200 papers. Six sections, running simultaneously, will deal with management problems in production, administration, distribution, personnel or labor relations, agriculture, and the home.

### ANNOUNCE LAKE GEORGE MANAGEMENT CONFERENCE

Twentieth annual conference on industrial relations, conducted under auspices of the industrial department, National Council of Y.M.C.A.'s, will be held at Silver Bay, on Lake George, N. Y., Aug. 25-28. Dr. J. Douglas Brown, Princeton university, will present a feature address on "Industrial Relations Under Today's Conditions."

Other speakers will include: Edward F. McGrady, assistant secretary of labor, Washington; Philip Murray, chairman, Steel Workers Organizing committee, CIO; L. C. Morrow, editor, *Factory Management and Maintenance*, New York; Merritt B. Lum, industrial relations, Johns-Manville Inc., New York; and Frank Rising, labor editor, *Business Week*, New York.

### TRANSIT ASSOCIATION WILL CONVENE IN SEPTEMBER

Fifty-sixth annual convention of the American Transit association and its affiliates will be held Sept. 19-23 at the Greenbrier hotel, White Sulphur Springs ,W. Va. This meeting will bring together executives, operators and mechanical men representing more than 90 per cent of the transit operations in the United States, Canada and Mexico. In addition, many representatives of manufacturing companies producing equipment used in the transit field will attend.

Headquarters of the association are at 292 Madison avenue, New York.

# Financial

### ARMCO EARNINGS HIGHEST IN HISTORY OF COMPANY

AMERICAN ROLLING MILL CO., Middletown, O., in second quarter continued to reflect the increased operations following extensive modernization, and the quarter is certain to establish a new high record for any such period in its history. The June figures are expected to exceed those of March, which were the best the company has experienced.

A conservative estimate for second quarter net profits is $4,000,000, after depreciation, interest and federal income taxes. This is equal to more than $1.40 cents per share on the 2,868,500 common shares outstanding June 30. The final figures may amount to $1.50 cents a share. This compares with 80 cents a share for first quarter. For second quarter of 1936 the figure was 68 cents a share.

**Additional news of the steel and metalworking industries will be found on pages 102-104.**

### WHEELING'S EARNINGS SHOW MARKED INCREASE

In the first five months of 1937 Wheeling Steel Corp., Wheeling, W. Va., had net profits of $2,693,521 after charges. For first quarter the company reported a net of $1,308,807, compared with $10,922 in the same period last year and $882,199 for the first six months of 1936.

## Follansbee Reorganization Plan Approved by Court

Federal Judge R. M. Gibson last week in Pittsburgh gave preliminary approval to a modified plan of reorganization of Follansbee Bros. Co.

The modifications, asked for recently, include reduction of the proposed bond issue from $4,500,000 to $4,000,000 and the estimated cost of proposed plant improvements from $4,800,000 to $4,000,000.

Judge Gibson's order states that although the modifications are not materially adverse to the interests of security holders, nevertheless they provide for the allowance of withdrawal of acceptance of the company's reorganization plan up to July 19.

The order also states the court is satisfied that sufficient proof has been submitted and that the plan is fair. It directs the company to serve on all counsel of record a proposed form of final order of confirmation on or before July 14 for submission to the court for signature July 19.

## U. S. Steel, Westinghouse Sign for Fair Exhibits

United States Steel Corp. subsidiaries have contracted for 55,166 square feet of building space at the New York World's Fair of 1939. The site is situated on the central mall just north of the Horace Harding boulevard bridge leading to the marine amphitheater. L. A. Paddock, president, American Bridge Co., signed the contract on behalf of the Corporation subsidiaries. Walter Dorwin Teague, well known industrial designer, has been retained as consultant in the preparation of exhibits in keeping with the theme of the exposition—"The World of Tomorrow."

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., also has signed a contract for exhibit space. It provides for 10,992 square feet in the electrical production building. The company plans to present dramatically the part it will play in "The World of Tomorrow," which is the theme of the exposition.

The exhibit already is being planned to show scientifically how Westinghouse research and development work in the past 50 years will affect mankind in the next half century. It will include demonstration of the diesel engine and streamlined trains, polarized glass, new transportation devices, radio, television and X-rays.

## Six-Month GE Orders Top 1936 By 59 Per Cent

Orders received by General Electric Co. during the first six months this year amounted to $217,265,619, an increase of 59 per cent over the $136,968,597 received during the same period last year, President Gerard Swope announced last week. The record first half year was in 1929 when orders received amounted to $220,716,456. Orders received during the second quarter of 1937 amounted to $111,518,589, the largest since the third quarter of 1929.

# Activities of Steel Users and Makers

STEEL STAMPING CO., Lorain, O., is completing erection of an addition which, with floor space of 16,000 square feet, will house spot welding, washing, enameling, warehouse and tool and die departments. New equipment includes two 7-inch stroke, No. 8 Consolidated, geared presses equipped with Marquette air cushions, Blakeslee automatic, conveyor type machine for washing stampings prior to enameling, several electric spot welding machines and a number of smaller units. The company manufactures toys and specialties.

♦ ♦ ♦

Penn Electric Switch Co., Des Moines, Iowa, has moved to an entirely new plant at Goshen, Ind.

♦ ♦ ♦

Rheem Mfg. Co., Richmond, Calif., has acquired the National Steel Barrel Co., 3860 East Ninety-first street, Cleveland.

♦ ♦ ♦

Westinghouse Electric & Mfg. Co., East Pittsburgh, has acquired the A B See Elevator Co. Inc., 419 Fourth avenue, New York.

♦ ♦ ♦

American Nut & Bolt Co., Pittsburgh, will construct a $10,000 extension to its plant at 2029 Doerr street, Pittsburgh.

♦ ♦ ♦

Uecker Equipment Co., 6228 West State street, Milwaukee, maker of tubular steel scaffolding, has changed its name to Safway Steel Scaffolds Co.

♦ ♦ ♦

Southern Textile Machinery Co., Paducah, Ky., recently developed a new machine for looping the heel gore of full fashioned stockings. As a result, such stockings may be knitted completely on a single machine. Variations in the knitted fabric which resulted when knitting the leg on one machine and the foot on another are prevented by the use of the new looping machine.

♦ ♦ ♦

Columbia Alkali Corp., Barberton, O., recently placed in operation a new chlorine plant and also a plant for the manufacture of bicarbonate of soda.

♦ ♦ ♦

New York Belting & Packing Co., Passaic, N. J., has appointed Whittle Hose & Rubber Co., 549 West Randolph street, Chicago, as distributors of its mechanical rubber goods in the Chicago district.

♦ ♦ ♦

Haynes Stellite Co., Harrison and Lindsay streets, Kokomo, Ind., has announced plans for construction of a new two-story office building, 44 x 132 feet, at its plant. The new structure is the first of several planned.

♦ ♦ ♦

Detroit Rex Products Co., 13005 Hillview avenue, Detroit, manufacturer of degreasing equipment, will build a new factory, its second expansion within a year. R. A. Emmett is president of the company.

♦ ♦ ♦

American Range Corp., Shakopee, Minn., recently placed in production a full line of oil burning parlor furnaces of various capacities, as well as an entire new line of coal or wood ranges and coal or wood parlor furnaces.

♦ ♦ ♦

Modern Grinder Mfg. Co., 112 South Second street, Milwaukee, has leased the Gurney Refrigerator Co. plant at Brook street and Forest avenue to manufacture hand and motor-driven grinders, hydraulic jacks, etc. Eli Bockshe is president.

♦ ♦ ♦

Edward W. Voss, 3241 Latonia avenue, South Hills, Pittsburgh, is new agent in the United States for plate, sheet, and strip straightening machines and roller levelers originally designed and built by Fritz Ungerer, of Germany. The machines will be built in this country on United States and Canadian patents.

♦ ♦ ♦

Cheney Weeder Co., Cheney, Wash., has added two products of recent development. One is a rotary rod weeder and tillage machine, with tractor hitch, which may be used in one, two, three, four or five sections so as to have any desired capacity. It is adaptable to hilly land. The other is an eccentric harvester reel for more efficient harvesting of grain. A notable feature of the latter is its construction in large part of aluminum alloy.

♦ ♦ ♦

Deere & Co., agricultural implement manufacturer, has purchased the plow factory of Killefer Mfg. Corp. Ltd., 5525 Downey road, Los Angeles. Killefer plows will be built as previously, and the Killefer name and personnel will be retained, according to O. P. Robb, vice president.

♦ ♦ ♦

Wisconsin Grey Iron Foundry Co., 7225 West Main street, Wauwatosa, suburb of Milwaukee, has purchased the casting plant of the former National Brake & Electric Co. on Belleview place, from Westinghouse Air Brake Co. About $20,000 will be spent for modernization. John E. Burke is president.

♦ ♦ ♦

Dexter Co., Fairfield, Iowa, has redesigned its line of washing machines. In addition to streamline design, they include new features such as large balloon rolls with automatic pressure, positive forced feed lubrication to all moving parts and one-piece cast aluminum wringer frame and gear head. All models may be driven by electric motor, gas motor or power pulley.

♦ ♦ ♦

Continental Can Co. Inc., New York, plans to further diversify its and sale of crown caps or seals for business through the manufacture bottles and cap sealed cans. Initial orders have been placed for part of the equipment, although a considerable portion of machinery required is being developed in the company's own shops. Present plans provide that the first units will be established at the company's plants at Baltimore and Chicago, with subsequent units to be located at Jersey City, N. J.; Seattle, and Oakland, Calif.

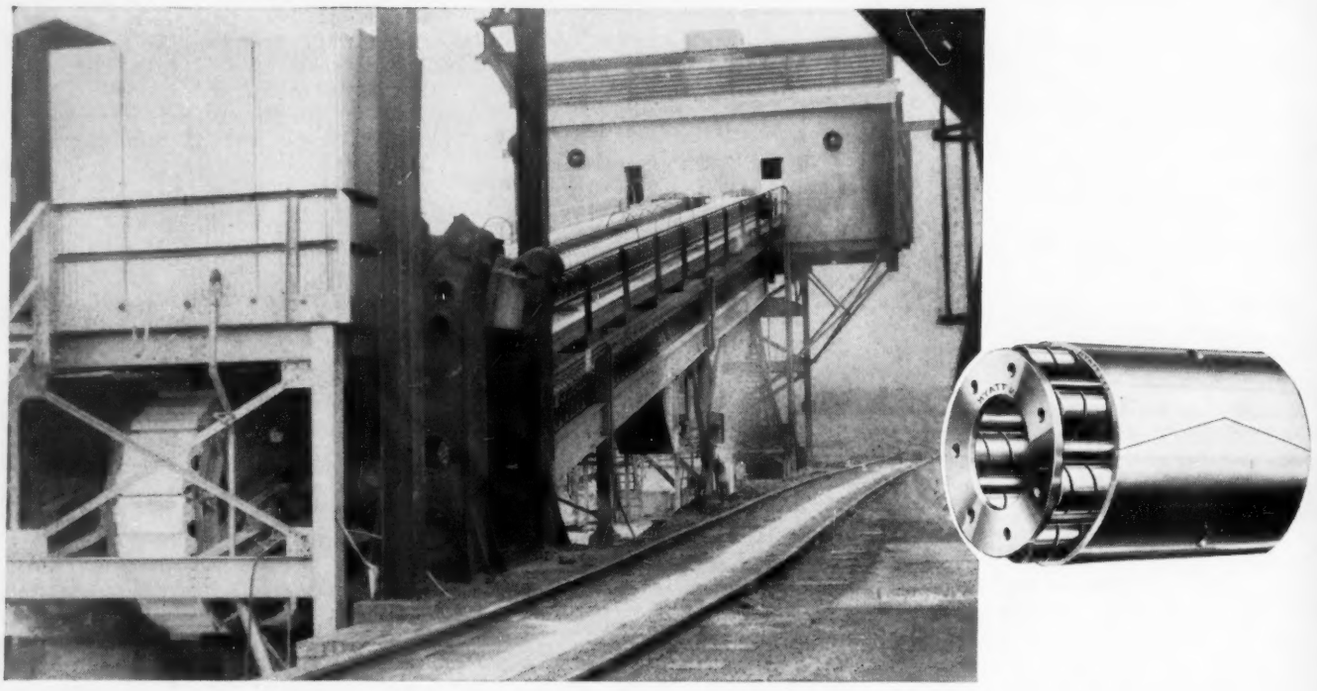
♦ ♦ ♦

Century Electric Co. has moved its New York offices from 50 Church street to larger quarters at 30 Vesey street.

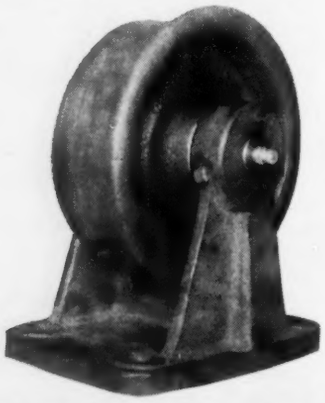
## Streamlined Refrigerator Truck Body Made of Stainless Steel

*THIS streamlined 24-foot refrigerator truck body is stainless steel, built by the Edw. G. Budd Mfg. Co. on a full automatic Fruehauf trailer for Davidson's Transfer Co., Baltimore. Tractor is a streamlined Autocar of cab-over-engine design*

# BEARINGS *that thrive on* HARD USAGE



• 752 Hyatts in the rollers of this Pig Machine. Designed by Steel Industries Engineering Corporation and built by Mackintosh-Hemphill. Now in operation at one of the large Ohio mills.



In the drive for more and more production, machinery is being geared up to punishing speeds and loads. Wherever power, load, and speed meet . . . bearings are on the *spot*. Yet stresses and strains that would lick ordinary bearings, are mere "set-ups" for Hyatt Roller Bearings.

In keeping pace with the demands of today, Hyatts are setting new standards of operating performance and economy. Power is saved, maintenance is saved, and wear is eliminated. In any place where the going is tough, remember Hyatts are equal to it. Hyatt Bearings Division, General Motors Corporation, Newark, Detroit, San Francisco. Hyatt Roller Bearings Sales Company, Chicago and Pittsburgh.

**HYATT** *Roller Bearings*

# MIRRORS OF MOTORDOM

*DETROIT*

SALT tablets experienced brisk demand in auto plants last week as a blistering July sun started the industry down the home stretch for 1937 assemblies. Despite the heat and the loss of one day's production, however, assembly lines are holding a good pace and as yet there is no sharp tapering which would indicate start of changeovers to new models.

All producers are geared closely to the flow of retail orders, making production an accurate gage of car buying. Backlogs of orders are being cleaned up, but releases on materials and parts for current models still are coming through, indicating the public is not showing any inclination to postpone purchases until new models are announced. In fact, there is some disposition to favor buying a late 1937 model over waiting for an early 1938 model, the reasoning being that the former will be sure to have all the "bugs" ironed out at this stage, and that this is an off-year for radical changes in models anyway.

**Grilles To Be Completely Revised**

But you can be sure there will be no difficulty distinguishing between 1937 and 1938 models, however minor other changes may be. Practically all radiator grilles will come in for complete revision. Fender contours will be altered appreciably. Bodies will be wider, both Packard and Buick, for example, planning to add several inches to the rear-seat width.

Mechanically, it appears the new jobs will offer no striking innovations. Buick, of course, will make much over its "four knees," although the use of coil springs on rear wheels will not represent true independent suspension as the term is now understood. The new automatic transmission which Oldsmobile recently announced as optional equipment for its 8 may be offered as optional equipment on Buick for next year.

Olds is turning out about 175 cars per day equipped with this automatic transmission which is manufactured at the new Buick transmission plant No. 55 in Flint, Mich. An effort is being made to stock all dealers with these cars, although as yet this has not been done. Eastern and middle western dealers have been supplied, but only a few cars have made their appearance on the Pacific Coast.

**BY A. H. ALLEN**
*Detroit Editor, STEEL*

It is considered likely the transmission will be offered as optional equipment on the Olds 6 next year, and assuming a favorable public response, it will be made standard on the 8 later in the model year. According to present reports drivers are showing considerable enthusiasm over the device. It is just about conceded among engineers here that before too many years the gearshift lever will have disappeared from all cars and control of the transmission will be through the accelerator pedal and auxiliary hand levers. But first the driving public must be educated to become familiar with the operation of such devices and to demand them on new cars. Sometimes this process of development is slow.

ROUNDING out the complement of iron and steel producing equipment which Ford is in process of laying out and installing, and summarized here in recent weeks, is a proposed new battery of coke ovens to be erected at the Rouge plant. Two batteries of 40 ovens each have just been completed, and the additional battery will add 40 more ovens.

Reports of a new body plant to be built at the Rouge plant within the next year have caused some speculation over how this will affect Briggs which now makes a large

## Among Ideal Summer Jobs

*HOT summer days hold no discomfort for these two Buick engineers in the dynamometer division who have donned clothing of arctic explorers for running engine tests in a cold room, where subzero temperatures are maintained to check engine performance in frigid atmospheres*

# MIRRORS OF MOTORDOM

share of the Ford bodies in a part of Ford's Highland plant leased by Briggs. In recent years Briggs has become more closely allied with Chrysler as a body builder, and now is reported to do more business with Chrysler than with Ford. Later this month the merger between Briggs and Motor Products will be formally consummated, further knitting together Chrysler's body supplies.

Experts now see the eventual knitting together of Briggs and Chrysler interests, with the former becoming the "Fisher Body" of Chrysler Corp. Briggs showed a profit of some $10,400,000 in 1936 and, with Motor Products now in the fold, should nicely round out the Chrysler picture, especially in view of the fact there are some 60 acres of vacant property in back of the Motor Products plant, adjoining the Briggs Mack avenue plant, which could be used for further expansion.

### Chrysler Has Grown Rapidly

A summary of the Chrysler Corp. plant properties may throw some interesting light on the progress of the company in the last few years. Chrysler and De Soto occupy the large Jefferson-Kercheval plant; De Soto assemblies and a heavy press plant are housed in a new, modern plant on Wyoming avenue; Plymouth passenger and commercial cars emanate from the extensive new plant on Mt. Elliot avenue; Dodge cars are made in a plant on Joseph Campau, Dodge trucks in a plant on Lynch road, the latter a former Graham-Paige plant. The Highland Park division houses general and engineering offices, service parts and export organizations; marine engines and specialties are produced by Amplex Mfg. Co. division, at the Dodge truck plant; smaller specialty plants are operated on Conant road and Harper avenue.

Three plants are located across the river in Windsor—one for service parts and truck assembly, one for assembly of all four Chrysler lines, and a third the new Canadian engine plant now under construction.

The corporation also assembles Plymouth cars at plants in Evansville, Ind., and Los Angeles, Dodge trucks likewise being assembled at the latter. Gears, axles, forgings and machined parts for Dodge are produced at New Castle, Ind., while at Kokomo, Ind., a new transmission plant is going up on the old Haynes property.

Chrysler has an air conditioning division at Dayton, O., Pekin Wood Products Co. at West Helena, Ark., and a plant at Marysville, Mich., which handles sheet metal parts, painting and enameling. Reports have been rife for some time about Chrysler expansion at Marysville, but corporation officials discredit such stories. It is understood official slant on the Marysville situation is that the city has not "grown up" sufficiently for Chrysler to go ahead with further plans there.

To this list must be added the new plant mentioned here last week, presumably for manufacturing commercial cars and trucks, although construction work on the latter has yet to be started. If you now add to this setup the Briggs and Motor Products plants, you have an amazing picture of automotive development from the day when Chrysler, Zeder, Skelton and Breer rang the bell with the original Chrysler roadster.

The corporation apparently is formulating some important plans for expansion into the truck and commercial car field in the next few years. A study of the truck sales picture well justifies such plans. One report is that production of Plymouth commercial cars will be more than doubled for next year. For the first five months of this year, Plymouth sold over 4500 commercial cars, compared with only 1146 in the same period last year.

## Automobile Production

Passenger Cars and Trucks—United States and Canada
By Department of Commerce

| | 1935 | 1936 | 1937 |
|---|---|---|---|
| Jan. | 300,335 | 377,244 | 399,634 |
| Feb. | 350,346 | 300,810 | 383,698 |
| March | 447,894 | 438,943 | 518,977 |
| April | 477,059 | 527,625 | 553,415 |
| May | 381,809 | 480,518 | 540,357 |
| 5 Mos. | 1,957,443 | 2,125,140 | 2,396,081 |
| June | 372,085 | 469,368 | †477,200 |
| July | 35,297 | 451,206 | ..... |
| Aug. | 245,075 | 275,934 | ..... |
| Sept. | 92,728 | 139,820 | ..... |
| Oct. | 280,316 | 230,049 | ..... |
| Nov. | 408,550 | 405,799 | ..... |
| Dec. | 418,317 | 519,121 | ..... |
| Year | 4,119,811 | 4,616,437 | ..... |

Estimated by *Ward's Automotive Reports*

| Week ended: | |
|---|---|
| June 12 | 118,798 |
| June 19 | 111,620 |
| June 26 | 121,032 |
| July 3 | 122,890 |
| July 10 | 100,981 |

| | Week ending July 10 | July 3 |
|---|---|---|
| General Motors | 40,091 | 50,490 |
| Ford | 27,172 | 27,210 |
| Chrysler | 21,050 | 28,775 |
| All others | 12,668 | 16,415 |

†Estimated.

SWELTERING lawyers appeared before John T. Lindsay, 39-year old trial examiner for the national labor relations board last week as the hearing of the UAW complaint against Ford got under way in the Federal building. Interminable testimony and cross questioning over details of the recent reception which union organizers stepped into at the Rouge plant when they attempted to distribute literature to Ford employes on Ford property made it appear the hearing would drag out possibly a month or more.

Ford attorneys, headed by Louis J. Colombo Sr., made numerous objections to certain phases of the testimony but were over-ruled by Lindsay in practically every instance.

### UAW Organizers Disciplined

Meanwhile on Wednesday the UAW had planned to make another distribution of literature to Ford employes as they went to and from the plant, but at the last minute called off the plans, attributing the decision to receipt of an anonymous telegram promising more trouble if the union plans were carried out. At 6 a.m. a crowd of state officials and others had gathered at the gate 4 of the Rouge plant to witness the distribution. Harry Bennett of the Ford personnel department also was present, but the UAW representatives failed to materialize.

At Flint, the executive board of the UAW took disciplinary action against three organizers by demoting or transferring them to other districts, for their part in the numerous contract-breaking strikes which have cropped up there in recent weeks. It is difficult to believe General Motors officials will be persuaded by such trivial action that the union has any control over its membership.

Scattered rumblings of discontent on the labor front continue to make the front-page headlines. A four-hour shutdown at the Dodge truck plant resulted over refusal of union men to work with nonunion men. A nonunion workman at another plant here was beaten severely by 30 union men as he went to his car to go home from the plant. His only offense had been refusal to join the UAW.

However, the feeling is increasing

(*Please turn to Page* 104)

# WINDOWS OF WASHINGTON

BY L. M. LAMM
*Washington Editor, STEEL*

*WASHINGTON*

THERE was a definite rumor here last week to the effect that an open break was imminent between the President and John L. Lewis, presumably because of the way the steel strike has been handled. Questioned on this subject at one of his semiweekly news conferences Mr. Roosevelt refused to make any comment, other than to call it a foolish question and not worthy of answer.

All of which again brings up the question of the White House conferences. A week or so ago, the President told one of the newsmen that he should hide his face in a corner and put on a dunce cap because of a question on the third-term problem. There was a bad reaction from this among the Washington correspondents, there being a feeling that the President is taking an undue advantage in trying to make a fool of a newspaperman for asking a question based on a legitimate situation, but which the President does not care to answer.

At the same conference last week Mr. Roosevelt said that he had not had a plea from a member of congress to help straighten out the break between the CIO and the A. F. of L. The President said at the time that he had no such request.

### ASKS TEN PER CENT CUT IN GOVERNMENT SPENDING

By asking the various government departments to make a saving of some 10 per cent over the present fiscal year the Chief Executive hopes to make a saving of some $400,000,000, he stated, and in that way expects to balance the budget in the year 1937-1938, he contends. This saving is from the regular government departments and they have already been cut to the bone, so to speak, by both the budget bureau and congress, and now the President is asking for another 10 per cent cut. In some departments, it is contended that this cannot be done.

Mr. Roosevelt hopes, he stated at his press conference, that the government reorganization bill can be passed at the present session of congress. That all depends, of course, on how long he can hold congress here. Washington prognosticators have now stopped even guessing when congress will adjourn.

### SCRAP EXPORT PROBES YIELD MANY STATISTICS

May exports of iron and steel scrap amounted to 637,000 tons, according to department of commerce figures, which is an alltime post war peak for such exports. Of this tonnage the largest quantity went to Japan, England and Italy. This tonnage is almost as much as the entire exports for the first four months of last year.

It is believed by government officials that of this tonnage 20 per cent is fit for consumption in the United States, while it is said that the other 80 per cent consists of mixed country scrap which has everything in the world in it and requires too much work to segregate for use in this country.

In connection with this scrap situation the interstate commerce commission has completed a survey at the request of the secretary of commerce and the secretary of state, in conjunction with the joint survey which those departments made in connection with the scrap legislation now pending in both houses of congress.

This report, which is comprehensive, gives sample railroad rates on both domestic and export iron and steel scrap from various cities to various export points. A comparison of these rates shows a substantial differential in export trade rates under domestic. These differentials apply generally on shipments moving from many of the larger cities through most of Atlantic, Gulf and Pacific coast ports.

The report states that a general adoption by the railroads of a plan of increasing export scrap rates to a domestic basis would increase railroad revenue from scrap by probably a minimum of $2.50 a ton and in excess of $5,000,000 a year, assuming that exports for the next twelve months will equal the more than 2,000,000 tons forecast for 1937 on the basis of the first quarter movement.

The report itself covers the export scrap movement by both ports and railroads for January-May this year. It states that the volume represented accounts for a great proportion of all the export scrap handled by railroads.

In the first quarter of this year, says the report, iron and steel scrap exports were 586,369 tons or at the rate of 2,345,476 tons per annum. The figures indicate an increase of 25 per cent in tonnage for the first quarter of this year compared with the same period of last year.

It is stated in the report that little or none of the home or plant scrap is exported but most of such exports are derived from purchased scrap.

#### Figures Not Consistent

Tables given with the report show that the gross tonnage of scrap originating on Class I railroads in 1936 was 11,430,679 tons compared with 8,497,312 tons in 1926.

For the first quarter of this year the total movement reported by Class I railroads aggregated 473,298 tons. This figure may be compared, says the report, with a figure of 568,000 tons of iron and steel scrap reported by the department of commerce as exported from the United States during the first quarter. In other words, the report says, the exported figures are about 20 per cent above the railroad figures. Except for a few additional railroad reports of exports which may be received later, the difference between the two figures presumably repre-

sents export scrap arriving by motor truck and water. Some government officials do not figure that this is good reasoning. The indicated total for 1937, therefore, the report says, based on railroad handling of 2,395,000 tons increased by about 20 per cent for motor truck and water deliveries would give a total of 2,874,000 tons for export in 1937.

### SECRETARY PERKINS BACKS DOWN ON SIT DOWNS

"Sit down strikes are unsuited to the modern life in this country" and "from many aspects the method appears to be one which should be abandoned," Secretary of Labor Perkins said last week. This is the first time as far as is known, that Madam Perkins has made a statement of this kind. Asked if he agreed with this sentiment, the President at a press conference said that he had not had a chance to read Miss Perkins' comments on the subject.

Miss Perkins made this statement in a letter to Representative J. William Ditter, Pennsylvania, in answer to a question asking that she clarify the position of her department on sit down strikes.

"It is not and never has been an official position of the department of labor or of the secretary," she said, "that sit down strikes are either lawful, desirable or appropriate. In fact the officers of the department and the secretary have urged union leaders and members not to use the method and to bend every effort to take men out of a plant where used. In many cases they have done so."

Still discussing the sit down strikes Madam Perkins said that "it is full of hazards to the progressive, democratic development of trade unionism and to the orderly processes of collective bargaining . . . . There are many possibilities of its abuse and the hazard of lack of discipline is serious . . . I believe that it will be abandoned by the unions."

### HOUR-WAGE BILL BEING PRUNED TO HARMLESSNESS

It is apparent that someone is trying to take all the "kick" out of the hours and wages bill and this is in accord with the fact that the administration does not seem to be taking as much interest in this legislation as it indicated it would on introduction of the bill.

The senate committee on education and labor Thursday ordered a favorable report on the bill, with some drastic changes from the original. Among other things the committee suggests that the power of the board be limited to wages not over 40 cents per hour, and a work week not under 40 hours. This is in accord with the original suggestions of the President.

Another agreement which is in the nature of an amendment to the original bill would eliminate the power of the board to establish "fair" labor standards above the basic non-oppressive standards.

Under the tentative action taken by the committee sections four and five of the bill would be completely revised. These are the two sections which caused most of the criticism when hearings were held. Industrial representatives told the committee in connection with these sections that they gave too much power to the new board. Some of the labor representatives agreed on this point.

Committee members feel, it is reported, that standards should be fixed for the whole country as nearly alike as possible, making due allowance for special circumstances.

### SOCIAL SECURITY TAX RETURNS ARE LAGGING

Delinquent employers in the steel industry have been advised by Guy T. Helvering, commissioner of internal revenue, to make immediate tax returns as required under the provisions of titles eight and nine of the social security act, to avoid further payment of drastic penalties which are now accruing.

Commissioner Helvering pointed out that every person employed in the steel industry comes under the provisions of title eight, which imposes an income tax on the wages of every taxable individual and an excise tax on the pay roll of every employer of one or more. This tax is payable monthly at the office of the collector of internal revenue. The present rate for employer and employe alike is one per cent of the taxable wages paid and received.

Under title nine of the act, employers of eight or more persons must pay an excise tax on the annual pay roll. This tax went into effect Jan. 1, 1936, and tax payments were due from employers only, at the office of the collector of internal revenue the first of this year. This tax is payable annually, although the employer may elect to pay it in regular quarterly installments.

### NEW LINEUP MAY EASE STATE-COMMERCE TENSION

Significance of the nomination by the President of Wilbur J. Carr as minister to Czechoslovakia and of George S. Messersmith now minister to Austria to take Carr's place as assistant secretary of state is not yet known.

Carr has been connected with the state department for some 40 years and for the past 20 years has been assistant secretary of state in charge of foreign service personnel. It is Carr who has persistently worked to have the foreign service division of the commerce department transferred to the state department. Needless to say the commerce department has consistently fought this.

The shifting of Carr will certainly ease this situation. Not many months ago there was a new accord between these two departments through which the state department turned over to commerce some of the activities which had formerly been attended to by the foreign service division of the commerce department but which were taken away from the latter at the time the present administration came into power.

It so happens that Dr. Alexander Dye, present director of the bureau of foreign and domestic commerce, and Mr. Messersmith were located in the same country at one time and there is a sincere friendship between them. This also should work toward closer co-operation between these two departments. Those who have followed this matter closely during the past few years have expressed confidence that this troublesome situation will finally be adjusted equitably.

### GERMAN PIG IRON OUTPUT HOLDS AT HIGH LEVEL

German pig iron production during April, 1937, totaled 1,306,182 metric tons against 1,303,932 tons during the preceding month and 1,210,813 tons during April, 1936, advises American Vice Consul James H. Wright at Cologne in a report to the bureau of foreign and domestic commerce.

Steel ingot production in April at 1,644,527 metric tons compared with 1,581,736 tons during the previous month and 1,467,383 metric tons during April 1936.

Blast furnaces in operation numbered 115 during April out of 175 in existence, compared with 113 out of 176 available in March.

### BRITISH DUTY REDUCED

The British treasury issued an order July 2, according to a cablegram from Commercial Attache Lynn Meekins, London, to the Department of Commerce that, effective from July 7 to March 31 of next year, there is to be a reduction to 2½ per cent in the import duty on all quota shipments of iron and steel products except on wire products. The cable says further that "duty on shipments excess quota and on all shipments rough or machined castings, stampings, pressings weighing 7 pounds or over other than gutters, domestic tanks, cisterns and on rough or machined forgings reduced to 12½ per cent. Wire products not affected."

# Editorial

## Persecution Is Not Key to Equitable Tax System

IN APRIL of this year the United States treasury department discovered that the income taxes for 1936 were falling far short of expectation. Later President Roosevelt called the attention of the nation to the methods employed by some wealthy individuals to escape or reduce federal income taxes. Still later a joint congressional tax committee took up a study of tax evasion.

Shortly after the committee convened, the following appeared in some newspapers:

> "Washington, June 15.—The congressional probe of income tax 'dodgers' and their devices, which ended its second day today, will last for many days. The committee today asked for a $50,000 appropriation and decided to bare the names of all who have resorted to questionable practices. . . .
>
> "Elmer L. Irey, chief of the intelligence unit of the bureau of internal revenue, made public the names of the seven men involved in the foreign corporation phase of the investigation. They are: (*Here followed seven names, including:*)
>
> "Jacob Schick, retired lieutenant colonel and inventor of the 'dry shaver' razor."

Colonel Schick's name appeared in the papers again on July 4—this time in connection with the notice of his death on July 3. From the detailed obituary in *The New York Times,* we reconstruct this brief summary of his career:

> "It was only within the last few years that Colonel Schick began to amass his fortune. For many years he had been placing various inventions on the market, but none had any commercial success.
>
> "Born in Ottumwa, Iowa, Mr. Schick grew up in the Southwest. . . . In 1898 he enlisted at Portland, Oreg., in the Fourteenth United States infantry. From that time until his retirement in 1910, his career was spent in the army. He went to the Philippines. . . . Sent back to the United States . . . with a bad attack of amoebic dysentery, he remained in a hospital for a year.
>
> "Upon advice of physicians, he was transferred to the Twenty-second infantry at Fort Gibbon, Alaska. The cold climate of the North proved beneficial to his health. . . .
>
> "Lieutenant Schick retired in 1910 and engaged in mining explorations in British Columbia. He also staked claims in Alaska and while on a camping trip the idea came to him which later brought him his fortune. With the weather at 40 degrees below zero, he found it difficult to shave. . . . For weeks he worked on his problem and finally evolved a razor that could do the job without lather or the other traditional concomitants of shaving. . . . It was not until 1929 that the idea, now greatly improved, was put on the market.
>
> Lieutenant Schick served in the World war, having been commissioned as a captain, and was promoted to major and later lieutenant colonel.
>
> "After leaving the army, Colonel Schick tried to perfect his dry shaver and place it on the market, but without success. He used money from his other inventions to carry on this venture and at one time his wife mortgaged her house for $10,000 to enable the work to continue.
>
> "In 1929 he put his invention on the market, but the idea did not get immediate response. Two years later he opened a factory in Stamford, employing about 100 persons. Today more than 1,200,000 Schick razors have been sold. About 1500 people are employed in the Stamford plant and large laboratories and factories are operating in Montreal.
>
> "Colonel Schick forsook his American citizenship in 1935 and became a citizen of Canada. He aroused the indignation of President Roosevelt who charged that this had been done 'to escape our income and inheritance laws.' Friends of the Colonel declared that these charges were unfair, explaining that his physicians had recommended the cold climate of Canada."

Many readers will recognize the foregoing as a typical "success" story along the lines of traditional American individualism. Here was an inveterate "inventor," who struggled for years before he found an idea that "clicked." Handicapped by a tropical disease, contracted while in the military service of his native country, that handicap, which prompted army doctors to prescribe the rigors of a cold climate, ultimately helped him to evolve the one invention which proved to be a paying proposition.

### Tax System Unjust to Small Business Ventures; New Deal Made Loophole for Foreign Corporations

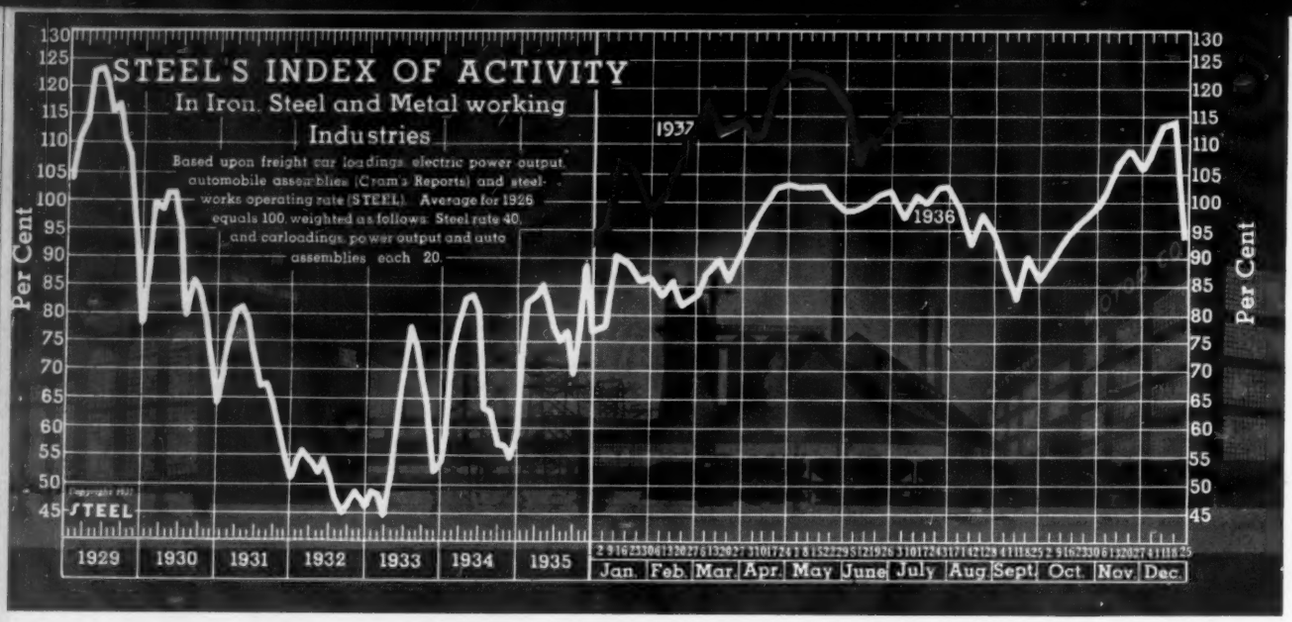
As in the cases of so many other inventors and industrialists, Colonel Schick's reward came after many years of adversity. Unfortunately our lawmakers have seen fit to ignore the losses of adversity and to see only the profits of the good years. The result is a tax system that is unjust to the small business man who goes through a long ordeal of development and emerges into rich rewards suddenly.

Again, the 1936 tax law, which penalizes undistributed profits heavily, is unfair to many companies.

Also, in the 1932 and 1934 tax laws, a tax on capital gains was collected on foreign corporations or non-resident individuals just as it was collected on domestic corporations or persons. But the 1936 law, under new deal sponsorship, provided a loophole whereby a foreign corporation, non-resident here, is exempt from tax on capital gains.

The practice which politicians now are denouncing so vociferously was made possible by a loophole of their own authorship—a loophole that did not exist in the 1932 and 1934 laws.

Under these circumstances the publication of the names of some of the alleged tax "evaders" is nothing short of malicious persecution.


STEEL'S INDEX OF ACTIVITY
In Iron, Steel and Metal working Industries
Based upon freight car loadings, electric power output, automobile assemblies (Cram's Reports) and steelworks operating rate (STEEL). Average for 1926 equals 100, weighted as follows: Steel rate 40, and carloadings, power output and auto assemblies each 20.
Per Cent
1937
1936
STEEL
1929
1930
1931
1932
1933
1934
1935
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

*STEEL'S index of activity gained 2.6 points to 115.4 in the week ending July 3:*

| Weed ending | 1937 | 1936 | 1935 | 1934 | 1933 | 1932 | 1931 | 1930 |
|---|---|---|---|---|---|---|---|---|
| May 1 | 123.9 | 103.2 | 84.6 | 86.0 | 60.3 | 52.5 | 87.7 | 103.3 |
| May 8 | 123.5 | 103.0 | 79.4 | 84.4 | 62.5 | 54.7 | 79.7 | 102.8 |
| May 15 | 123.2 | 103.1 | 80.5 | 82.4 | 65.2 | 54.3 | 78.7 | 102.5 |
| May 22 | 122.2 | 100.4 | 82.8 | 81.9 | 66.1 | 55.1 | 78.3 | 102.3 |
| May 29 | 115.6 | 98.6 | 71.9 | 75.7 | 65.3 | 54.2 | 75.7 | 94.9 |
| June 5 | 105.1 | 98.8 | 79.3 | 82.3 | 69.9 | 51.0 | 73.5 | 97.9 |
| June 12 | 111.4 | 99.4 | 80.0 | 83.6 | 72.1 | 51.1 | 73.2 | 96.2 |
| June 19 | 110.3 | 101.0 | 77.3 | 81.8 | 73.9 | 51.8 | 70.9 | 95.0 |
| June 26 | 112.8† | 101 9 | 78.4 | 79.4 | 77.0 | 51.6 | 70.6 | 94.0 |
| July 3 | 115.4* | 97.5 | 64.1 | 52.3 | 71.4 | 49.2 | 64.1 | 75.0 |

*Preliminary. †Revised.

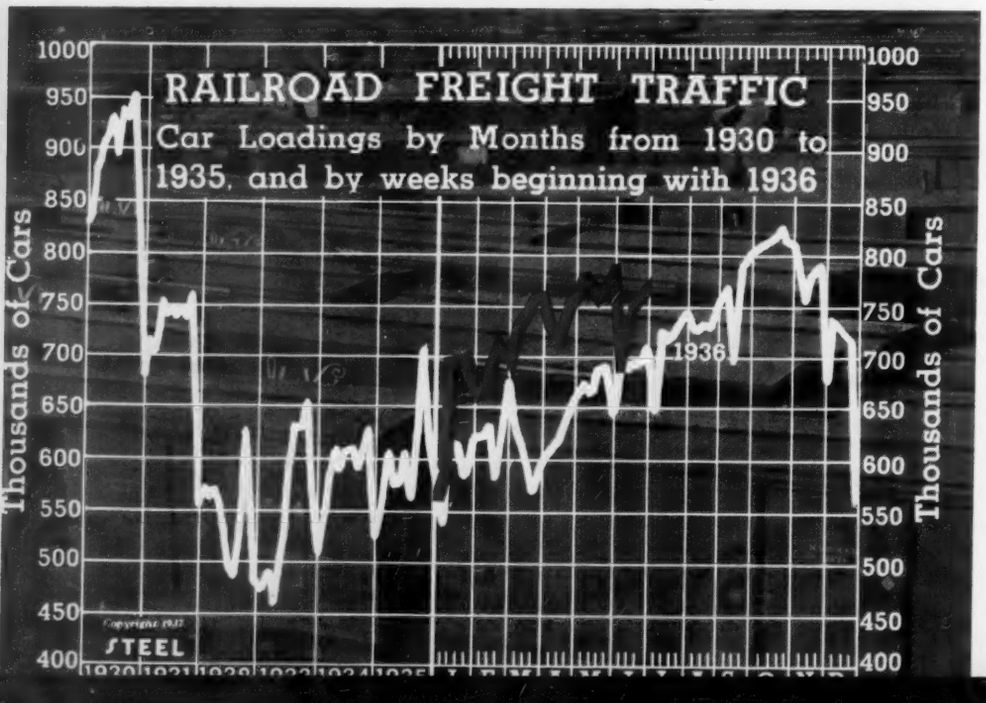
# Tone of Business is Stronger In Pre-Holiday Week

AS IF to demonstrate a vigor that had been obscured by recent labor difficulties, business gave a good account of itself in the week preceding Independence day. Industrial activity was at a higher rate, the upward trend in commodity prices was more positive and the stock market took a new lease on life.

The most impressive of these three indicators was industrial activity. STEEL'S index climbed from 112.8 in the week ending June 26 to 115.4 in the week ending July 3. The gain of 2.6 points was due largely to an increase from 74 to 77.5 per cent in the rate of steelworks operations and a rise from 773,733 to about 810,000 in revenue freight car loadings. Automobile output and electric power output showed only slight changes from the previous week.

A moderate step-up freight traffic is normal for the week preceding the July 4 holiday, but the indicated gain of more than 35,000 cars is unusual. This evidence of activity, appearing concurrently with the stiffening of commodity prices and the revival of volume trading in the stock market, has taken the edge off of the bearish sentiment which persisted in financial and industrial centers throughout the month of June.

However, optimism will remain under wraps until the extent of further labor difficulties and of seasonal influences is more clearly defined.

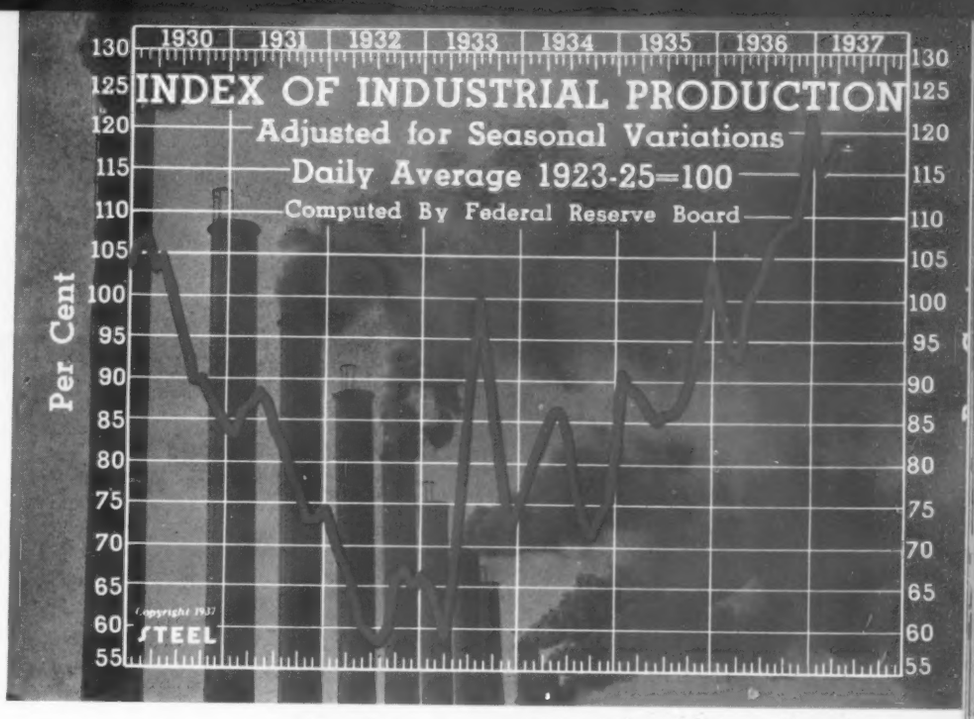

RAILROAD FREIGHT TRAFFIC
Car Loadings by Months from 1930 to 1935, and by weeks beginning with 1936
Thousands of Cars
1936
STEEL

| | 1937 | 1936 | 1935 |
|---|---|---|---|
| June 26 | 773,733 | 713,639 | 618,036 |
| June 19 | 756,289 | 690,716 | 567,847 |
| June 12 | 754,360 | 686,812 | 653,092 |
| June 5 | 692,140 | 695,845 | 630,836 |
| May 29 | 794,855 | 646,859 | 565,342 |
| May 22 | 779,276 | 683,406 | 599,543 |
| May 15 | 773,669 | 681,447 | 583,327 |
| May 8 | 767,481 | 668,935 | 575,185 |
| May 1 | 782,423 | 671,154 | 569,065 |
| April 24 | 761,182 | 666,181 | 558,886 |
| April 17 | 751,328 | 642,657 | 610,905 |
| April 10 | 716,044 | 622,138 | 587,685 |
| April 3 | 726,687 | 613,867 | 545,600 |

# BUSINESS TREND

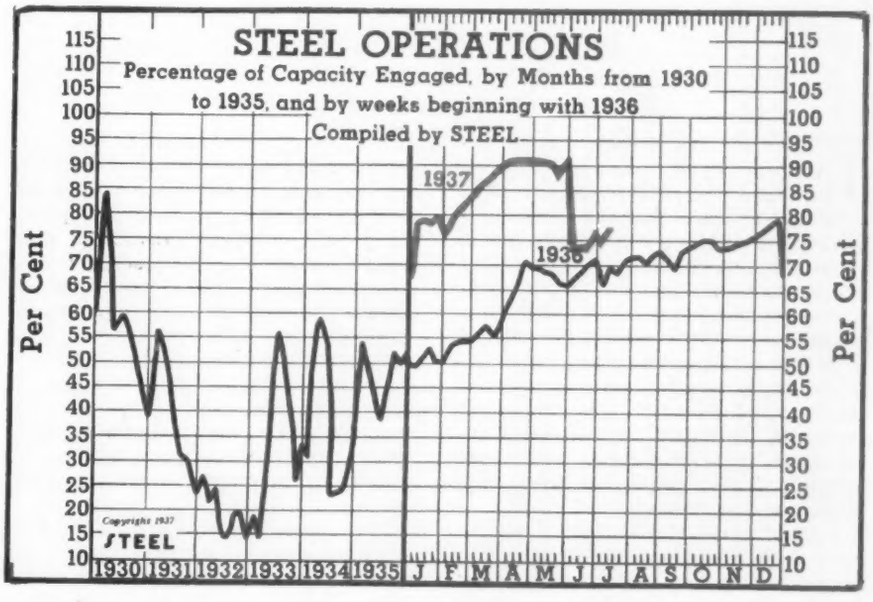
### Industrial Production Index Remains Unchanged in May

| | | | | |
|---|---|---|---|---|
| January | 115 | 98 | 91 | 78 |
| February | 116 | 94 | 89 | 81 |
| March | 118 | 93 | 88 | 84 |
| April | 118 | 98 | 91 | 78 |
| May | 118 | 101 | 85 | 86 |
| June | ... | 103 | 86 | 84 |
| July | ... | 107 | 86 | 75 |
| August | ... | 108 | 87 | 73 |
| September | ... | 109 | 89 | 71 |
| October | ... | 109 | 95 | 73 |
| November | ... | 114 | 98 | 74 |
| December | ... | 121 | 104 | 86 |


INDEX OF INDUSTRIAL PRODUCTION
Adjusted for Seasonal Variations
Daily Average 1923-25=100
Computed By Federal Reserve Board
Per Cent
1930 1931 1932 1933 1934 1935 1936 1937
Copyright 1937 STEEL

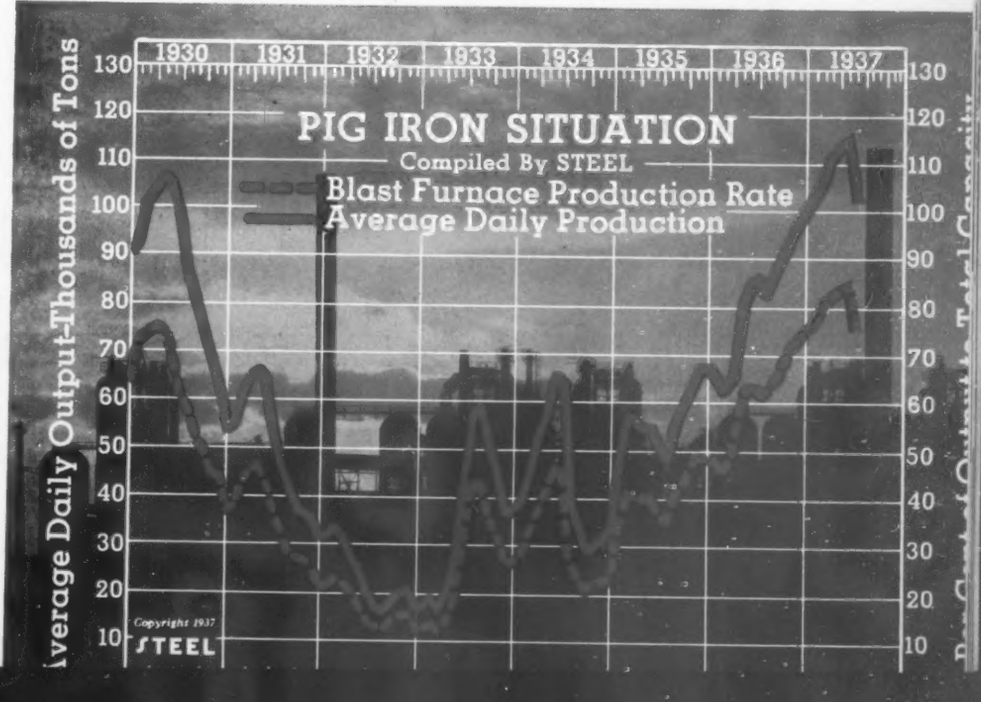
### Steelworks Operations Up 3.5 Points to 77.5 Per Cent

| | Per Cent | | |
|---|---|---|---|
| | 1937 | 1936 | 1935 |
| July 3 | 77.5 | 66 | 31 |
| June 26 | 74 | 71.5 | 37 |
| June 19 | 75.5 | 70.5 | 35.5 |
| June 12 | 74 | 68 | 39 |
| June 5 | 75 | 67 | 41 |
| May 29 | 75 | 66 | 42.5 |
| May 22 | 91.5 | 66.5 | 44 |
| May 15 | 89 | 68.5 | 45.5 |
| May 8 | 91 | 68.5 | 44.5 |
| May 1 | 91 | 69.5 | 44 |
| April 24 | 91.5 | 69.5 | 46 |
| April 17 | 91.5 | 70.5 | 46 |
| April 10 | 91.5 | 66.5 | 45 |
| April 3 | 91.5 | 63.5 | 44 |


STEEL OPERATIONS
Percentage of Capacity Engaged, by Months from 1930 to 1935, and by weeks beginning with 1936
Compiled by STEEL
1937
1936
Per Cent
1930 1931 1932 1933 1934 1935
J F M A M J J A S O N D
Copyright 1937 STEEL

### Daily Output of Pig Iron Down 9.2 Per Cent in June

| | Daily Average, Tons | | Blast Furnace Rate, Per Cent | |
|---|---|---|---|---|
| | 1937 | 1936 | 1937 | 1936 |
| Jan. | 103,863 | 65,461 | 76.6 | 48.2 |
| Feb. | 107,857 | 63,411 | 79.5 | 46.6 |
| March | 111,951 | 66,004 | 82.5 | 48.5 |
| April | 113,354 | 80,316 | 83.7 | 59.1 |
| May | 114,360 | 85,795 | 84.3 | 63.1 |
| June | 103,822 | 86,551 | 76.6 | 63.6 |
| July | ..... | 83,735 | .... | 61.5 |
| Aug. | ..... | 87,475 | .... | 64.3 |
| Sept. | ..... | 90,942 | .... | 66.9 |
| Oct. | ..... | 96,509 | .... | 71.0 |
| Nov. | ..... | 98,331 | .... | 72.3 |
| Dec. | ..... | 100,813 | .... | 74.2 |


PIG IRON SITUATION
Compiled By STEEL
Blast Furnace Production Rate
Average Daily Production
Average Daily Output-Thousands of Tons
1930 1931 1932 1933 1934 1935 1936 1937
Copyright 1937 STEEL

# Methods Used in Making

**Protection of metal finishes during assembly operations is accomplished by the so-called invisible spot weld**

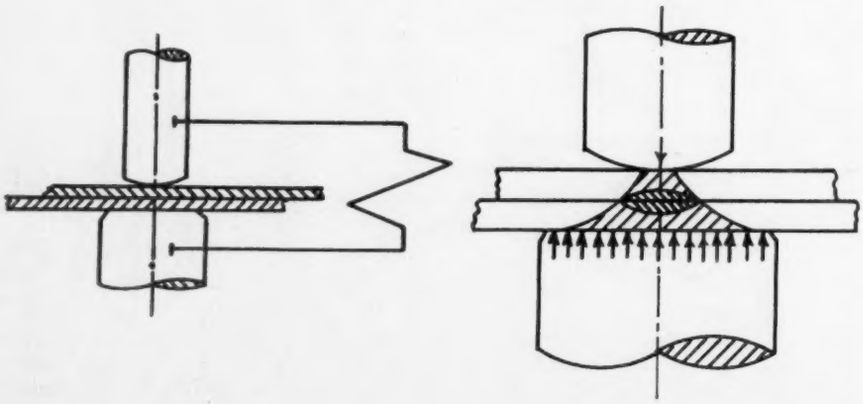
TECHNIQUE of producing "invisible" spot welds has been known for several years. The first machine for this purpose was completed in 1921, as a result of a series of experiments, conducted by the writer. Since then, many machines, rating from 2 to 100 kilovolt-ampere capacity, have been installed to serve various industries, especially for the production of parts where high metal finish is required; for instance, scientific instruments, automotive parts, special hardware, surgical instruments, electrical appliances and others.

But in spite of the fact invisible spot welding has been used for a number of years, details regarding the method are not yet generally known. It may therefore be of some interest to discuss the possibilities and the practical side of this production method.

It may be advisable to begin with an *important reservation*, often overlooked by ambitious salesmen of welding equipment: invisible spot welds *cannot* be produced under any and all circumstances. Like other production methods the possibility of applying invisible spot welding depends upon certain conditions, and of course upon the use of the proper welding equipment. Furthermore, it is almost impossible, with present means, to produce invisibility on both sides of the weld, with few exceptions. In most of the practical applications, however, an invisible weld is required on only *one* side of the welded parts.

The principle of the method is rather simple theoretically; although the practical application requires some experience. The first requirement is: A large contact surface on the side of the invisible weld; second: A carefully determined welding pressure, and means to keep the pressure uniform in production; third, the correct type of welding transformer, permitting instantaneous welding; and fourth, a timing control to guarantee short-cycle timing, with the necessary amount of uniformity.

**FIG. 1 (left) — The electrode arrangement as used for producing welds invisible on one side only. Fig. 2—(right)—Enlarged section of the weld showing heat distribution**



### Electrode Arrangement

Fig. 1 shows schematically the average electrode arrangement as used for producing invisible welds, on one side only. The lower electrode has a large electrode area, ¾-inch diameter or more. This prevents the electrode from marking the lower sheet, providing the other conditions are according to requirements. Fig. 2 shows an enlarged section of the weld.

The upper electrode is of the usual size; instead of the conventional point, however, a point with a convex surface of about 1 inch radius, is preferred. This type prevents a condition, as illustrated in Fig. 3, which would result in a heat concentration on one side, thus marking the lower sheet also. Another unfavorable condition enters when the operator neglects to place the sheets correctly between the electrodes, as illustrated in Fig. 4. This usually happens when the sheets are large and heavy, preventing electrode pressure from straightening the sheets automatically. A special electrode, successfully used for many years, to overcome this difficulty is shown in Fig. 5. This illustrates the principle, allowing many variations to suit

# Invisible Spot Welds

BY H. W. ROTH
President, Roth Welding Engineering Co., Detroit

the individual application. The self-adjusting swivel electrode is also useful for double spot welds, Fig. 6, or for certain applications in projection welding.

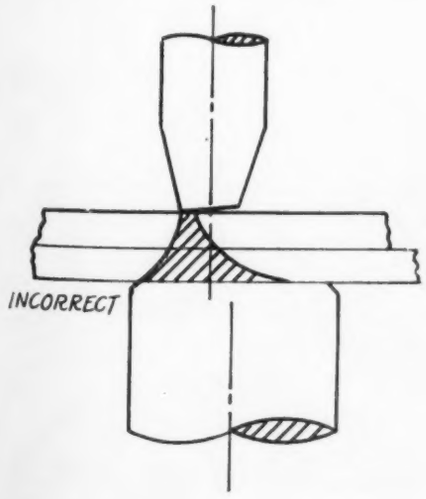
Of considerable importance is the material used for the electrodes. For the standard or smaller electrode point, any of the newer well known alloys, for instance "cupaloy" (s-m-s 103) may be used. For the large point, "cupaloy" or silver-tungsten are suitable. It is important to keep the large point in excellent condition during production. The surface must be absolutely smooth, preferably polished. Only fine emery cloth should be used for redressing. If this rule is followed, maintenance is not difficult.

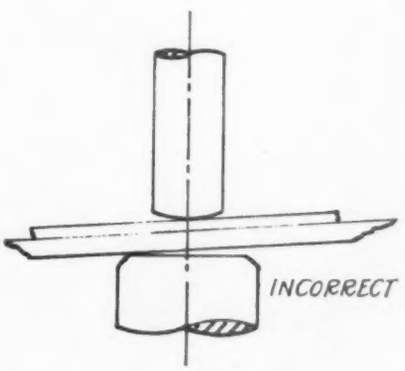
As a rule, electrode pressure for making invisible spot welds should be from 50 to 100 per cent higher than the pressure used in the conventional type of spot welding. This seems paradoxical at the first thought, as a higher pressure should have the tendency to mark the sheet metal more readily. The fact is, however, that the higher electrode pressure results in a better contact between sheet metal and electrode surface, which reduces the heating effect at the metal surface and consequently the possibility of marking. This is of great importance, as a higher current density is used for invisible spot welding than for ordinary spot welding, in most instances.

Current and timing are closely related to each other and shall therefore be considered jointly. The simple rule is: high current and shortest possible welding time. The theoretical reason for this requirement has been pointed out frequently in welding literature.

Figs. 7 and 8 show enlarged cross-sections of the sheet metal and indicate schematically the distribution of heat generated by the welding current in the sheet metal. Fig. 7 shows the effect of long welding time and low current, as used in conventional welding; while Fig. 8 illustrates the difference when short welding time (shot welding) and high current is used. In the first

**FIG. 3 (left)—Condition resulting from incorrect type of upper electrode. Fig. 4 (right)—Condition resulting from incorrect placing of sheets between electrodes**



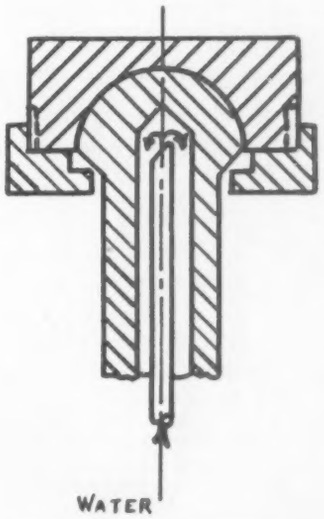




**FIG. 5—Sketch showing special type of self-adjusting swivel electrode**

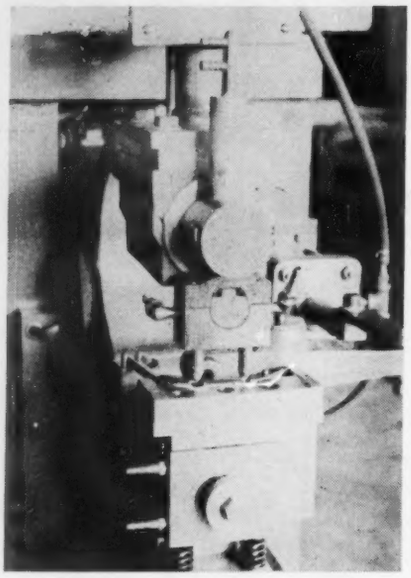


FIG. 6—Welding unit for producing double spot welds

instance, the heat develops slowly, spreading from the area of generation between the sheets, until it reaches the metal surfaces. It adds to the heating of the electrode points even before the proper welding heat has been reached between the sheets. The points sink into the softening sheet metal, leaving the well known impressions in the center of a dark blue circle. This is, for the old-timer in welding, an indication of an excellent weld; of course, it may be a fairly good weld, if the excessive annealing of the metal is excused, but certainly is not invisible. It takes a certain amount of grinding and polishing, if a neat appearance is required.

Fig. 8 shows schematically what happens when short welding time is used. This, of course, makes it necessary to apply higher current in order to generate the proper welding heat. The intense current passes through the contact area between the sheets, immediately steps up the heat, almost to the melting point, but before the heat has sufficient time to spread to the outer surface of the metal, the current is automatically disconnected and the water-cooled welding points, which maintain their pressure for a moment, help to chill the metal surface and avoid impression and discoloration.

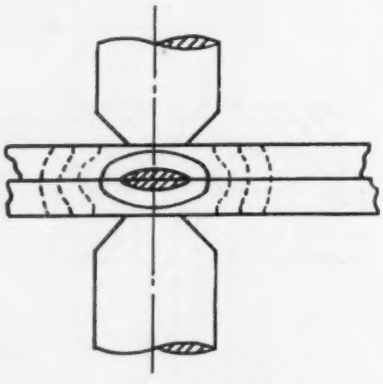
Fig. 9 is a photomicrograph at 50 diameters of a weld of this nature and shows clearly how the heat action is concentrated in the immediate area of the weld, without spreading to the metal surface. This explains why higher current density is necessary for producing invisible spot welds. It is difficult to establish a rule or to set up a formula, for determining the secondary voltage of the welding transformer, for this purpose. The throat depth, inductive losses, characteristics of the transformer itself, the shape of the parts to be welded, all these are determining factors. But it is safe to say, in most cases, an 80 to 100 per cent increase in voltage over the usual amount will be sufficient to obtain the proper current density.

It is easy to understand that the application of such high current density requires accurate timing, depending upon various conditions such as metal thickness, condition of the metal surface and the like. A welding time from ½ to 10 cycles may be used.

### Necessary Equipment

What type equipment is necessary to produce invisible spot welds in production? In some instances, it is possible to convert conventional foot-operated welders for this purpose, providing the metal thickness is not too great. Most conventional welders, however, have a transformer which is primarily designed for ordinary spot welding and therefore not suitable for producing invisible welds satisfactorily. Special welders have been designed for this purpose; foot-operated type for ordinary applications with low production; power driven or air-operated machines for high production.

Fig. 10 shows a foot operated machine of the hot-shot type, incorporating a special transformer of high power factor and high secondary voltage, a special spring arrangement for high electrode pressure and a short-cycle timing control. This machine can be used for invisible spot welding as well as conventional



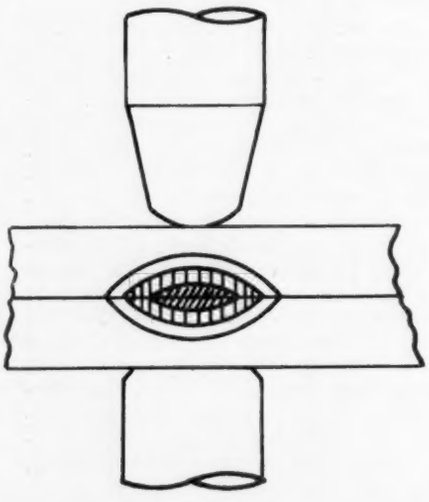


FIG. 7 (left)—Enlarged cross section of weld showing effect of long welding time and low current. Fig. 8 (right)—Different effect produced when short welding time and high current are used

FIG. 9—Photomicrograph showing concentration of heat in immediate area of weld. X-50

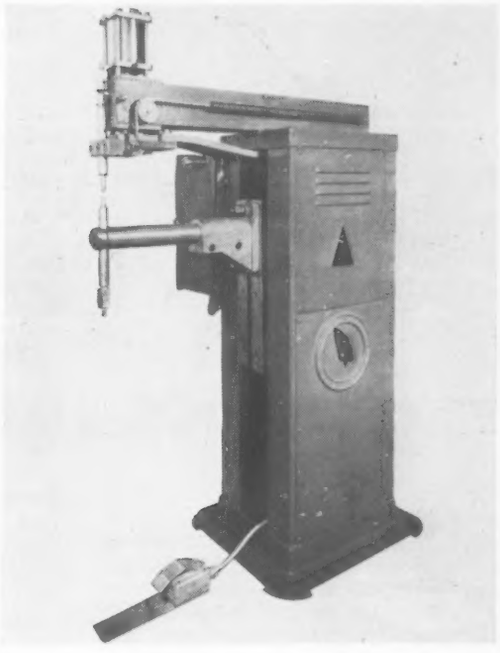


FIG. 10 — (left) — Foot operated welder for invisible spot welding or conventional spot welding. Fig. 11 (right)— Fully automatic air operated welder for higher production

spot welding. Where higher production is required, or where the conditions call for fully automatic equipment, an air-operated machine, Fig. 11, may be used, equipped with various types of short-cycle controls.

Fig. 12 shows a welder of the so-called synchromatic type, which was specially developed for high precision welding and invisible spot welding. It is equipped with a synchronous motor, which operates the movable electrode, as well as the automatic timer. An adjustable timing cam, in connection with a simple and efficient synchronizing adjustment, makes it possible to use a welding time of a fraction of a cycle. This welder is suitable for welding stainless steel, aluminum and other metals, as well as hot-shot welding on ordinary steel. In addition to the above, portable welders for invisible spot welding have been developed.

For multiple hydraulic spot welding, a new type hydraulic gun and special control equipment are available, which produce invisible welds on sheet steel or stainless steel, provided conditions are favorable.

With the proper type equipment and correct shape of electrodes no difficulties are encountered in producing invisible welds, if two sheets of the same thickness are to be welded.

In welding a light-gage sheet to a heavier gage, the larger point should be used on the side of the *heavier* gage metal. This will assure sufficient heat concentration between the sheets. Fig. 13 shows the reversed application, which should be avoided, because the large point chills the lighter gage metal and distributes current over too large an area, thus causing poor heat concentration between the sheets. For this reason, it is always difficult to obtain invisible welds on the side of the lighter gage metal.

In many cases, the conditions can be improved by using indirect welding methods. Fig. 14 illustrates the principle of indirect spot welding. The two sheets, *A* and *B*, are placed on an insulated support *C* (made of cupaloy or copper). A large electrode point *D* supplies current to the sheet *B*, while the welding electrode *E* per-

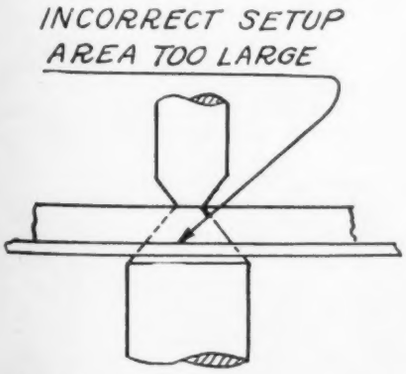



FIG. 13—Incorrect setup for welding light gage to heavy gage sheet in which large electrode chills the thinner sheet and distributes current over too large an area

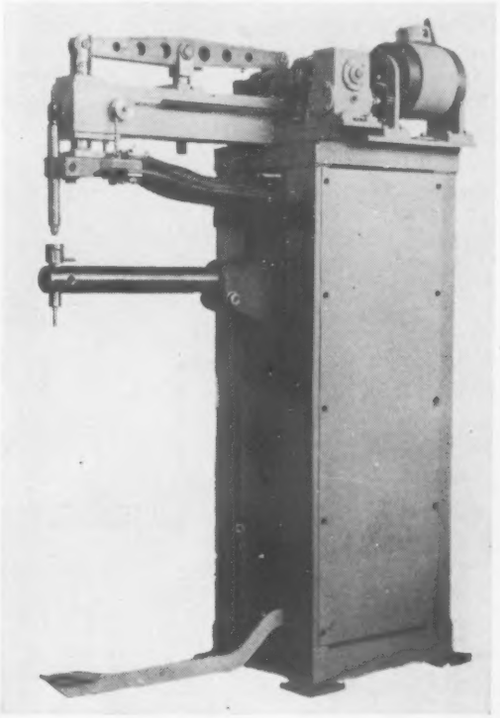


FIG. 12—Synchromatic type of machine for high precision welding and invisible spot welding

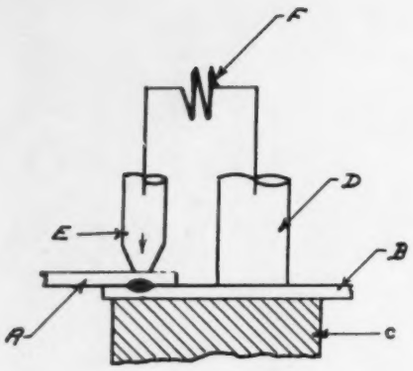



FIG. 14—Diagrammatic arrangement showing principle of indirect spot welding

forms the weld by completing the circuit from the welding transformer *F*. Both electrodes, of course, have independent pressure arrangements to equalize any difference in length. With this arrangement, the weld will be invisible on the lower side of sheet *B*. This arrangement is useful in welding tubular sections or box sections from the outside, to avoid deep throated machines and inactive losses.

The indirect method also may be used with projections in the upper or lower sheet as illustrated in Fig. 15. If sheets of different thicknesses have to be welded and the invisible weld is required on the lighter gage metal, a projection in the heavier sheet is sometimes helpful, providing the spots are not too close together.

The above examples illustrate the general principles of invisible spot welding. There are, however, many applications which may suggest or necessitate different ways and means; these must be worked out for the individual case. Conditions may not always be favorable, but experience in many industries has proved that spot welding no longer needs to spoil the appearance of a product or involve an unreasonable amount of metal finishing.

## Grinding as an Art in Tool Room Practice

*Tool Room Grinding*, by Fred B. Jacobs; cloth, 211 pages, 5½ by 9 inches; published by the Penton Publishing Co., Cleveland, and supplied by STEEL at $3.50 plus 15 cents for postage; in Europe by the Penton Publishing Co. Ltd., Caxton House, London.

Tool room grinding operations in various manufacturing centers differ widely, due to the nature of the work and to practices peculiar to given locations. In the present volume, the author has drawn his material from various manufacturing centers. Nearly 300 illustrations are used to elucidate the text. The book should prove a valuable aid to superintendents, foremen and tool designers and also contains information of great use to the individual toolmaker himself.

Various types of grinding machines used in tool rooms are illustrated and described, 58 illustrations being included in this section. On the subject of grinding jig components, the importance of accuracy is set forth and it is explained that jigs often can be finished for grinding more accurately and economically than they can be machined by other methods. Various types of jig bushings are described and directions given for their manufacture. Built-up jigs of both the welded and other forms of construction are described.

Subjects of arbors, counterbores and reamers are discussed and instructions given for making various types of plain and expansion arbors. Various types of reamers are described and directions given for their manufacture. Manufacture of milling cutters is described fully and various special fixtures to expedite production are illustrated and described. Full directions for cutter grinding are included. Precision gages of various types such as plug gages, ring gages, snap gages, etc., are illustrated and full directions are included for finishing accurately by grinding and lapping.

Grinding operations followed in die making also are included. The grinding of simple punches and dies is described and complete directions given for making sectional dies for various purposes. The profile method of generating die outlines is discussed. The subject of salvaging small tools by grinding is described interestingly. It is pointed out that ordinary milling cutters, milling saws, end mills, drills, etc., can be reclaimed by grinding and put again into use at a normal expense. Full directions for carrying out after various operations are given and numerous special fixtures are illustrated and described.

Parts of the book reflect the author's experience as a tool designer and toolmaker while other operations described were observed in various manufacturing centers. The book represents a treatise on grinding written along lines never before attempted.

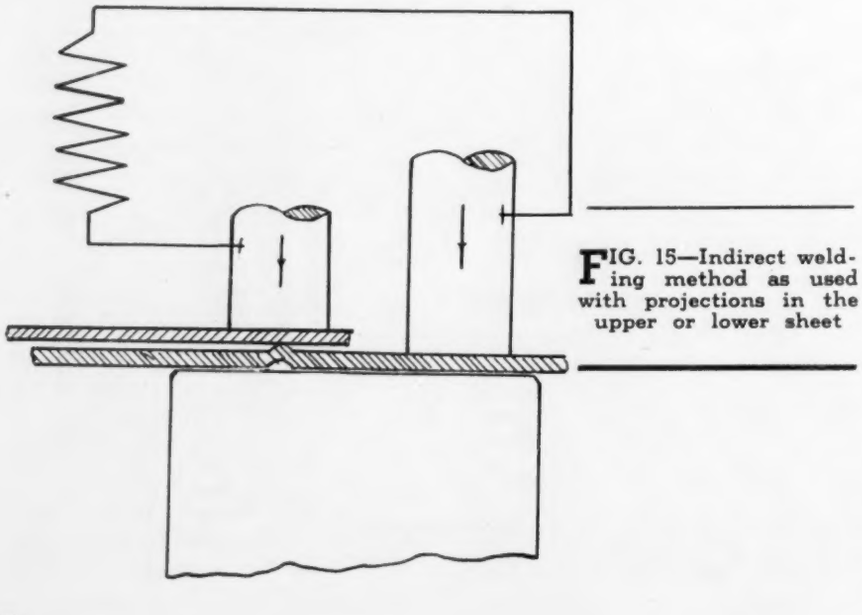


FIG. 15—Indirect welding method as used with projections in the upper or lower sheet

## Radiography and X-Ray Diffraction Discussed

*Symposium on Radiography and X-Ray Diffraction Methods;* cloth, 350 pages, 6 x 9 inches, 145 halftones and 50 line cuts; published by American Society for Testing Materials, Philadelphia; supplied by STEEL, Cleveland, for $4, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Twelve extensive technical papers and a large amount of discussion make up the symposium by leading authorities in the field. Six papers deal with radiography, covering principles, foundry applications, use in the welding shop, miscellaneous applications and similar subjects. Authors in this section include John T. Norton, Earnshaw Cook, J. C. Hodge, Herman E. Seeman, H. H. Lester and Norman L. Mochel.

Six papers devoted to diffraction cover equipment and methods, consituation of alloys, chemical analysis, determination of particle size, application to nonmetallic materials and to problems of cold work, preferred orientations and recrystallization. Authors include Charles S. Barrett, Kent R. Van Horn, Wheeler P. Davey, John T. Norton, G. Marvey Cameron and George L. Clark.

# Methods of Testing Are Studied At A. S. T. M. Annual Meeting

CORROSION of ferrous and nonferrous metals, methods of testing, specifications and methods of testing cast iron, and specifications for nonferrous metals were subjects which occupied the attention of members of the American Society for Testing Materials during the fortieth annual meeting of the Society at the Waldorf-Astoria, New York, June 28-July 2. Reports of sessions held early in the week were presented in STEEL for July 5, pages 28 and 50.

Various phases of testing methods were discussed at a session under the chairmanship of Prof. H. F. Moore, University of Illinois, Urbana, Ill. Report of committee E-1 on methods of testing by W. H. Fulweiler, Wallingford, Pa., summarized the activities of the various subcommittees. A paper, "A Classification of Methods of Mechanical Analysis of Particulate Materials", by P. S. Roller, bureau of mines, New Brunswick, N. J., was reviewed by Dr. L. T. Work, Columbia university, New York. Discussion of the paper by Dr. Work, and J. R. Dwyer, national bureau of standards, Washington, indicated that method of determining particle diameter was an important factor.

### Analyzes Brinell Test

R. H. Heyer, American Rolling Mill Co., Middletown, O., described an analysis of the brinell hardness test in which results indicated that sinking-in types of impressions are produced by relatively large underlying shear deformations while ridging types are produced by relatively large surface compressions. Also in most cases sinking-in types of impressions were associated with relative weakness in shear as measured by ratio of shear to compressive yield strength, and ridging types were associated with a high ratio of shear to compressive yield strength.

Direct measurements of plastic deformation in thick specimens indicated that permanent distortion occurred at a depth greater than some of the minimum thicknesses recommended for tests, but it is possible that such effect is negligible on measurement. Other pertinent conclusions also were drawn. In discussing the paper, R. L. Templin, Aluminum Co. of America, New Kensington, Pa., said that use of thin specimens for light alloys such as aluminum, gave good results due to various compensating effects including anvil effect of the testing machine. Dr. L. B. Tuckerman, national bureau of standards, Washington, stated that he preferred the term indentation tests rather than hardness tests, and that it would be well to investigate all variables associated with brinell testing to ascertain their effects.

### Studies Elastic Drift

Measuring elastic drift was the subject of a paper by R. W. Carson, Instrument Specialties Co., Little Falls, N. J., in which he described an electronic micrometer for measuring small deviations in elastic deflections occurring with continued time under constant load. The device is sensitive to deviations as small as a millionth of an inch, and was developed to measure deflections of spring members without disturbing the load deflection.

Records obtained show that drift continues indefinitely at a decreasing rate as long as the load remains, and that there is a recovery when the latter is removed. Discussion of the paper was opened by A. V. deForest who said that increasing care in the selection and preparation of spring members reduced elastic drift to a minor point. Dr. Tuckerman pointed out that investigation with the device in question should lead to improvement of springs, and cited particularly those used in the aneroid barometer.

L. A. Meisse, Ohio Brass Co., Mansfield, O., presented a paper in which he described a transfer mechanism for improving the adaptability of the Tuckerman optical strain gage so that it could be used in obtaining strain measurement in hitherto inaccessible locations. A paper entitled "Speed Control for Screw-Power Testing Machines Driven by Direct-Current Motors", by A. H. Stang and L. R. Sweetman, national bureau of standards, Washington, was presented by Mr. Stang. In a paper by R. K. Bernhard, Baldwin-Southwark Co., Philadelphia, on "Dynamic Tests by Means of Induced Vibrations", the author used motion pictures for illustrations. The method employed in the tests involves the production of vibrations in the structure or specimen by centrifugal forces resulting from revolving eccentric disks.

### Close Interpretation Needed

In discussing the paper, Dr. Tuckerman pointed out that the method employed is not quite as simple as it appears in the paper, and that caution is necessary in interpreting the results. Lieut. Commander Roof, United States navy, mentioned that it was necessary to see that there was no power leakage when employing the test. Dr. Moore pointed out that the author's use of temperature rise as an indication of failure was not always reliable.

The corrosion session was conducted under the joint chairmanship of F. N. Speller, National Tube Co.,

Pittsburgh, and R. J. McKay, International Nickel Co. Inc., New York. Report of committee A-5 on corrosion of iron and steel was presented by its chairman, F. F. Farnsworth, Bell Telephone Laboratories, New York.

As a part of this report, R. F. Passano, American Rolling Mill Co., Middletown, O., reported on the activities of subcommittee VIII on field testing of metallic coatings, and L. W. Hopkins, American Chain Co., Bridgeport, Conn., told of the activities of subcommittee VII on methods of testing. A brief report of the activities of committee B-3 on corrosion of nonferrous metals and alloys was presented by T. S. Fuller, General Electric Co., Schenectady, N. Y.

An interesting paper, "Corrosion Testing Methods for Copper Alloys", by D. K. Crampton and N. W. Mitchell, Chase Brass & Copper Co., Waterbury, Conn., was presented by Mr. Mitchell. The authors classified corrosion phenomena according to cause and result. Considerable emphasis was placed on the alternate immersion and water line tests and the results obtained.

The remainder of the session was devoted to further discussion of the papers presented at the symposium on corrosion at the Chicago regional meeting of the society last spring. The papers and discussions first were reviewed by Mr. Hopkins, with considerable discussion from the floor following.

Reports of several committees and the presentation of four papers featured the session on testing of cast irons under the chairmanship of Hyman Bornstein, Deere & Co., Moline, Ill. The report of committee A-3 on cast iron was presented by H. C. Aufderhaar, Electro Metallurgical Co., Chicago, secretary of the committee. This report recommended that present tentative standards under the jurisdiction of committee A-3 be continued as tentative without revision.

### Specifications Being Reviewed

Subcommittee IV on car wheels is working on a complete revision of tentative specifications for chilled tread cast iron wheels (A 46-30 T). Subcommittee VI on general castings has under consideration the establishment of deflection values in the flexure test for inclusion in the standard specifications for gray iron castings (A 48-36). Subcommittee XI on methods of testing will conduct research work on fatigue tests of cast iron.

The report of committee A-7 on malleable iron castings was presented by E. K. Smith, Electro Metallurgical Co., Detroit, chairman. Subcommittee I on nomenclature and definitions has approved the definitions of malleable cast iron and pearlitic malleable cast iron which appear in the tentative definitions of terms relating to cast iron (A 196-36 T), prepared by committee A-3 on cast iron. Subcommittee VI on pearlitic and alloy malleable iron has under consideration the preparation of proposed specifications for pearlitic malleable iron.

A paper, "Tensile Strength of Cast Iron," prepared by J. O. Draffin and W. L. Collins, University of Illinois, Urbana, Ill., and presented by Mr. Collins, reported a series of tests which indicated that different castings made from the same pouring had a variation of from 10 to 11 per cent in strength. Hollow and solid test specimens had nearly the same strength, the solid being from 2 to 5 per cent stronger. The authors found that the modulus of elasticity was not affected by any method of testing used but that the higher strength castings gave higher values. It was found that a solid machined specimen with threaded ends tested with spherical bearing blocks which allow an adjustment of the load, gave actual strength values unaffected by eccentricity.

### Study Effect of Loading

Loading and unloading specimens were found to have no pronounced effect on ultimate strength or maximum unit deformation. The test showed that when the material was loaded nearly to failure and then unloaded, there was permanent deformation of 40 to 50 per cent of the maximum deformation. In the bars broken, the fractures were not localized. The tests indicated that surface finish is not particularly important in tension.

A paper, "A Study of the Effect of Span on the Transverse Test Results for Cast Iron," by J. T. MacKenzie and C. K. Donoho, American Cast Iron Pipe Co., Birmingham, Ala., and presented by Mr. Donoho, described a series of tests which indicated that the modulus of rupture increases with decreasing span. Also, deflection decreases with decreasing span but the decrease is much less than the conventional beam formula would indicate. The test also showed that the modulus of elasticity decreases with decreasing span. The amount of the effect of changing span depends largely upon the qualities of iron.

Another paper, "Relation of Properties of Cast Iron to Thickness of Castings," by H. L. Campbell, American Hoist & Derrick Co., St. Paul, Minn., was read in abstract by James T. MacKenzie. The author concluded that the tensile and compressive strengths of gray cast iron are dependent upon the size of the castings from which the test specimens are prepared. The metal in a light section has a higher strength than metal of the same composition in a heavy section. In giving the tensile strength of iron, it is necessary always to state the size of the casting from which the test specimen was obtained.

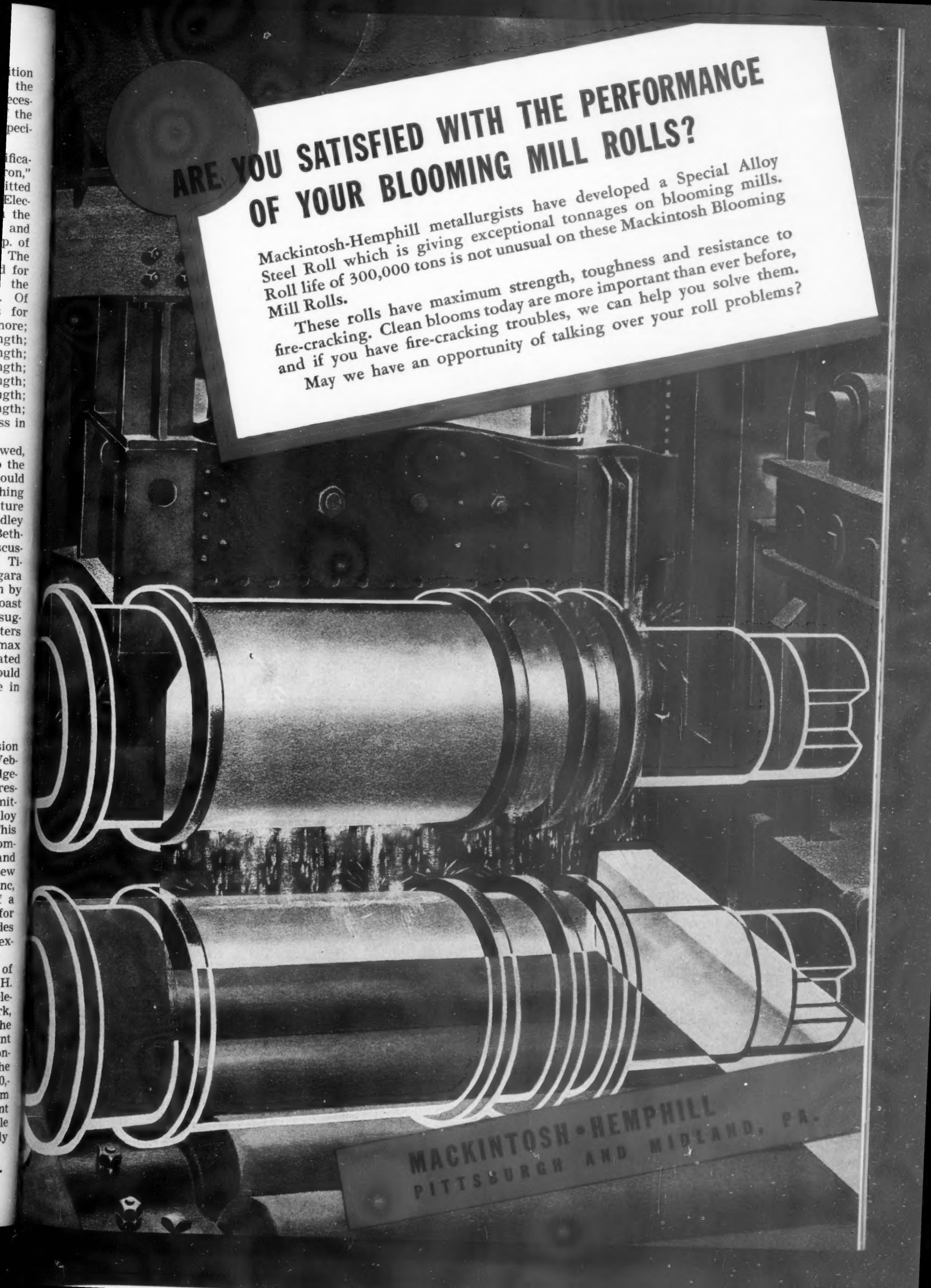
"A Proposed Standard Classification of Graphite in Gray Cast Iron," was the title of a paper submitted by W. E. Mahin, Westinghouse Electric & Mfg. Co., formerly with the Vanadium Corp. of America, and J. W. Hamilton, Vanadium Corp. of America, Bridgeville, Pa. The authors have set up a standard for classifying iron according to the length of the graphite flakes. Of these classifications, No. 1 is for flakes 4 inches in length or more; No. 2, flakes 2 to 4 inches in length; No. 3 flakes 1 to 2 inches in length; No. 4 flakes ½ to 1 inch in length; No. 5 flakes ¼ to ½-inch in length; No. 6 flakes ⅛ to ¼-inch in length; No. 7 flakes 1/16 to ⅛-inch in length; and No. 8 flakes 1/16 inch or less in length.

In the discussion which followed, C. K. Donoho called attention to the fact that some consideration should be given to the effect of polishing on the graphite flakes. That feature was discussed by Prof. Bradley Stoughton, Lehigh university, Bethlehem, Pa., and in a written discussion by George F. Comstock, Titanium Alloy Mfg. Co., Niagara Falls, N. Y. A written discussion by J. F. Johnson, Florida East Coast railway, St. Augustus, Fla., suggested standardizing on 50 diameters for such tests. A. J. Herzig, Climax Molybdenum Co., New York, stated that probably more attention should be paid to the form of graphite in setting up such standards.

### Offer New Zinc Standards

The nonferrous metals session under the direction of W. R. Webster, Bridgeport Brass Co., Bridgeport, Conn., opened with the presentation of the report of committee B-1 on copper and copper alloy wires for electrical conductors. This was followed by a report of committee B-2 on nonferrous metals and alloys which recommended a new tentative specification for rolled zinc, and the adoption as standard of a revision in the specifications for slab zinc (spelter) which provides for a special high-grade zinc of extreme purity.

A paper, "Fatigue Properties of Nonferrous Sheet Metals," by C. H. Greenall and G. R. Gohn, Bell Telephone Laboratories Inc., New York, described continuation tests on the fatigue properties of 25 different nonferrous alloys. Some of the conclusions arrived at are that the fatigue endurance limit at 100,000,000 reversals of stress varies from approximately 13.5 to 40 per cent of the tensile strength. High tensile strength alone does not necessarily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These rolls have maximum strength, toughness and resistance to fire-cracking. Clean blooms today are more important than ever before, and if you have fire-cracking troubles, we can help you solve them.
May we have an opportunity of talking over your roll problems?
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imply good fatigue characteristics. Fatigue characteristics of nonferrous sheet metals may be raised by cold working, but the resulting increase is not propertional to the increase in tensile strength.

Report of committee B-4 on electrical heating, electrical resistance and electric furnace alloys presented by Dean Harvey, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., included mention of the activities of subcommittee V on wrought and cast alloys for high temperature use. This subcommittee has completed proposed appendices for short and long-time tension tests which include preparation of cast tension specimens of heat resistant metals (chromium-nickel, chromium-nickel-iron, and chromium-iron).

These appendices cover specimens with shanks sufficiently long to remove threaded connections from the heated zone of the furnace, and describe a casting procedure which has been found satisfactory for producing sound castings. Equipment for the high-temperature bend test has been completed and tests are being made. A warpage test specimen in the form of an eccentric tube is being studied to determine the relative tendency of alloys to warp at elevated temperatures.

**New Device Tests Wire**

H. L. MacBride, Tinius Olsen Testing Machine Co., Philadelphia, presented a paper describing a device for determining the stiffness or flexure resistance of light wire, sheet and strips of various materials. Report of committee B-5 on copper and copper alloys, cast and wrought followed that paper, and was presented by D. K. Crampton, Chase Copper & Brass Co., Waterbury, Conn. The committee recommended for publication a tentative standard for copper and copper alloy seamless condenser tubes and ferrule stock. Subcommittee II on cast metals and alloys has not progressed far enough yet on considerations of adjustments in specifications covering various cast alloys to dispose of the tentative specifications for sand castings of the alloy: copper 80 per cent; tin 10 per cent; lead 10 per cent, which must be considered in relation to other alloys.

Report of committee B-6 on die cast metals and alloys, presented by J. R. Townsend, Bell Telephone Laboratories Inc., New York, included two papers one by J. C. Fox, Doehler Die Casting Co., Toledo, O., on "Brass Die Castings," and the other by G. L. Werley, New Jersey Zinc Co., Palmerton, Pa., on "A Study of Die Design Changes for the Improvement of the Soundness and Uniformity of Test Bars."

Sam Tour, Lucius Pitkin Inc., New York, presented the report of committee B-7 on light metals and alloys, cast and wrought, which recommended that a proposed tentative specification for aluminum base alloy in ingot form for permanent mold castings be accepted for publication, and also recommended revision of the tentative specification for aluminum base sand casting alloys in ingot form. Both specifications contain, as proposed, a section relating to the precision requirements in chemical analysis, but the committee requested that those be withdrawn from publication. Committees E-2 on spectrographic analysis, and E-3 on chemical analysis of metals also submitted reports.

# New Jig Eliminates Welding Troubles

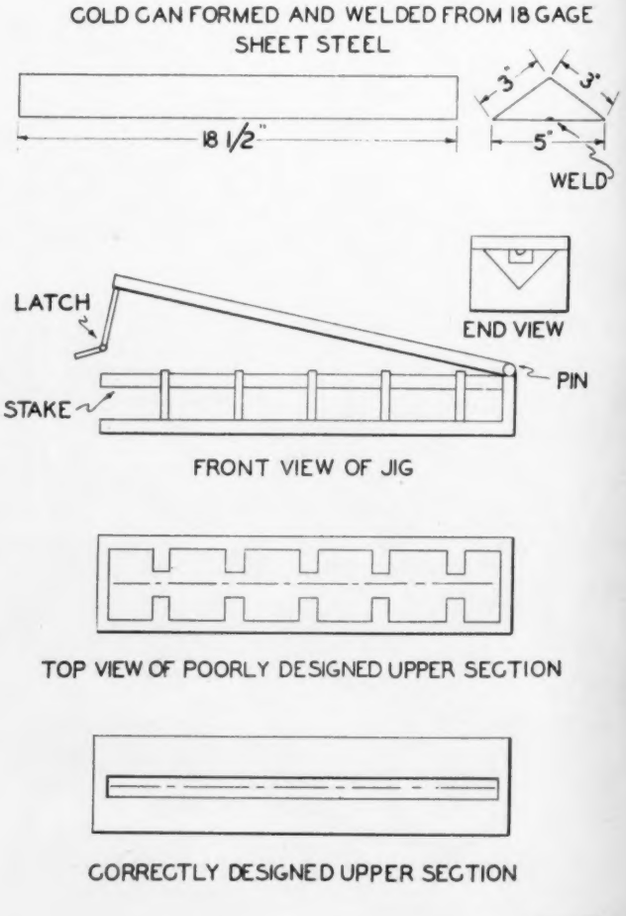
DUE to use of an improperly designed jig, an eastern company recently had difficulty in welding "cold cans." The cans are triangular in cross section, the legs of the cross section triangle being, respectively, 5, 3 and 3 inches long. The cans, 18½ inches long, are formed to triangular shape from 18-gage steel sheet and welded up the middle of the 5-inch side. Trouble was experienced due to warping and buckling which resulted from the welding operation. It was found that the welding jig was too light and frail and that it clamped the metal at only five points along the 18½ inch seam. As the welding proceeded the heat zone spread out and buckled the metal between the points where the clamp fingers were applied.

With a new jig of different design this trouble has been eliminated completely. The new jig has a cover plate which clamps the sheets throughout the 18½-inch seam, as shown in the accompanying illustration. Made in this way, with a narrow vee slot in the center, the cover acts as a more effective chill and clamp, thus reducing the spread of heat in the sheet steel and preventing buckling. It is essential that the grooved support beneath the welding seam also be firmly held against the under side of the seam in order to absorb the maximum amount of heat.

After closing the vertical seam, the can is completed by welding on the bottom and tacking on the handles.

## Makes Bulletin Signs

Pittsburgh Steel Drum Co., Butler, Pa., has added steel bulletin signs to its line of products. It has enlarged its steel drum decorating capacity to take care of this line of work.




These sketches show how a welding jig was redesigned so as to prevent warping of welded cans fabricated from 18-gage sheet steel

# MATERIALS HANDLING

## Cuts Cost of Handling Forging Flash In Automobile Transmission Plant

TO HANDLE three different products or materials automatically over the same path but to different destinations ordinarily requires the installation of separate conveying equipment for each. The problem is complicated further when any of the three materials originate from any of a number of different sources, each of which may supply any one of the three materials at various times. Such a problem as this confronted the Chevrolet-Muncie transmission plant of General Motors Corp., Muncie, Ind., in connection with the handling of forging flash from the trimming presses and it was solved by ingenious design of a single automatic conveyor.

### Scrap of Three Analyses

In the production of forgings for transmission units in the Muncie plant, steels of three compositions are used; namely, S. A. E. Nos. 1035 carbon, 4815 nickel and 5150 chrome steels. As production is scheduled to the forging units available, any press may be selected to make forgings of any of the three specifications. To obtain the best price for the scrap, the company finds it desirable to collect and keep the three grades of steel separate.

The solution which was worked out is an overhead basket-type continuous trolley conveyor, shown in Fig. 1, on which the baskets are loaded by special elevators, Fig. 2, operated from the floor. The 540-foot endless flexible-link chain trolley circles the forging shop and discharges the baskets into a three-section storage bin along the switch tracks outside the plant, as shown in Fig. 4.

The conveyor trolley runs on a 4-inch I-beam mounted 18 feet above the floor level. At the discharge end the trolley elevates the baskets at an angle of 36 degrees to clear the switch track and reach the outside storage bins on the opposite side of the tracks. The total height at point of discharge is about 40 feet. The bottom of the 1-inch mesh wire screen guard under the baskets leaves a clear headroom of 13 feet 8½ inches above the floor level.

### Baskets for Each Type

The baskets are of 1½ cubic feet capacity and are spaced 4 feet apart on the trolley. Each basket has a projecting lug on the side, this lug

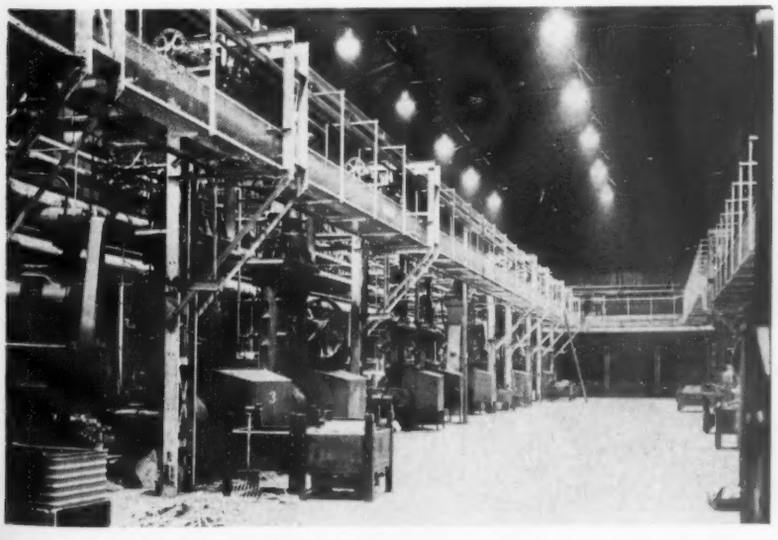


FIG. 1 (below)—General view of forge shop with chain trolley flash conveyor encircling the room. Note mesh guard to prevent injury of workmen from falling flash

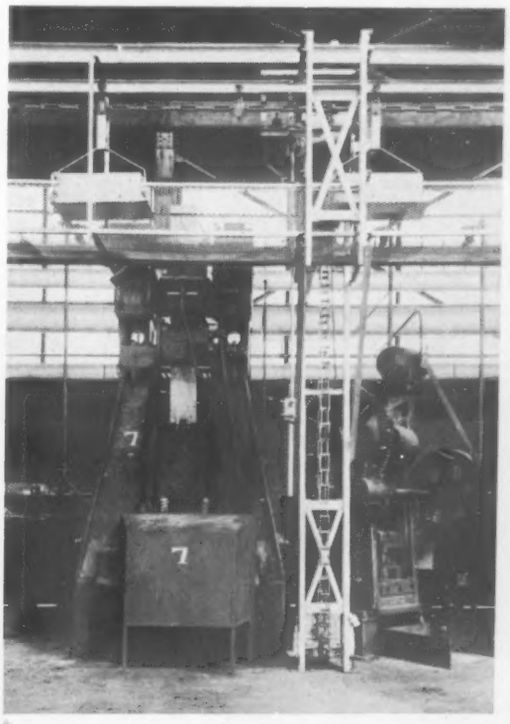


FIG. 2 (above)—One of the 14 elevator loading stations set between a hammer and trimming press. These loading stations also support the conveyor

# MATERIALS HANDLING

being set permanently in any one of the three positions corresponding to the type of scrap to be received by that basket. Thus a basket is restricted to one type of scrap. The number of each type of basket, however, is proportioned to the amounts of different types of flash handled with an ample surplus capacity so that the conveyor system does not operate with all of its baskets loaded.

Conveyor baskets are filled from buckets on vertical elevators, Figs. 2 and 3, set at 14 loading stations convenient to trimming presses and hand-controlled from the floor by the operator. These buckets will hold about 40 pounds of flash scrap which fills a basket. The elevators are permanently attached to building columns.

### Cycle Is Automatic

When the bucket, which sets at the floor level at the foot of the elevator, is filled, the trimmer presses a button. This starts the elevator, which raises the bucket to the top or discharge point above the conveyor basket, and dumps its load into a permanent hopper, Fig. 3, also above the basket, and returns to the floor level for refilling. This cycle is performed automatically once the operator has pressed the button.

The flash is retained in the hopper by a flop gate until an empty basket comes along with its lug set for that particular type of scrap. The projecting lug on the basket contacts a corresponding projecting setting on the hopper and operates a limit switch controlling a solenoid. This disengages the latch on the flop gate and the weight of the flashings swings the gate outward permitting the flashings to discharge into the basket.

The entire operation is so timed that the opening and discharge of the hopper takes place while the bucket is safely under the discharge chute. When the hopper is empty the flop gate is reclosed and latched by a lug on the floor bucket elevator chain as the bucket raises to the discharge point of the hopper. The limit switch or contact for discharging the hopper can be set in any of the three positions by a lever and notch plate within reach of the trimmer.

FIG. 4—Carried up this incline by the endless conveyor, the baskets dump their loads of flash in the proper bin and continue around for another load

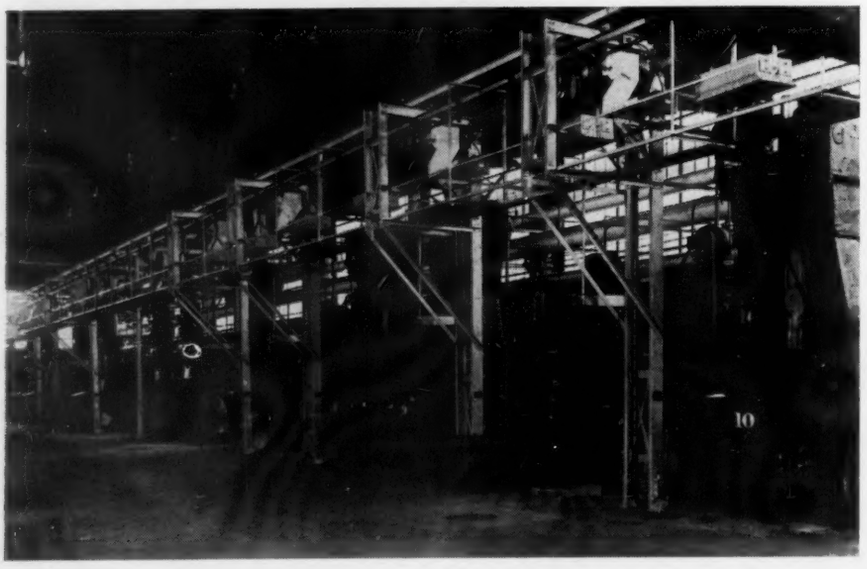


FIG. 3—Another general view of conveyor showing flash bucket at floor level, vertical elevator and loading hopper with chute for filling baskets

### System Is Interlocked

For safety purposes if the upper hopper has not been emptied when the trimmer attempts to send up another bucket of flash, due to failure of the limit or discharge switch, or not having found an empty basket, or for any other reason, an electrical interlock connected with the latch-opening solenoid on the temporary storage hopper will prevent the elevator motor starting, thus indicating that something is wrong. Also, if a basket of the type which should receive the particular type of flashing in the upper hopper arrives already loaded a paddle-switch mechanism, operated by the load in the basket, throws the limit switch operating lug out of contact position.

The conveyor basket is spring

# Untouched by Human Hand!

**. . . applies not only to the product itself but to the packages, too. This net load of 3,600 pounds of sugar is untouched from the time it is first piled on the pallets until time for use. It is picked up, transported, and stacked to the warehouse roof by the BAKER Fork Truck. When wanted for shipment, it is carried to the cars by the truck where it can be shipped directly on the pallets eliminating all rehandling and hand piling in the cars. • Perhaps BAKER materials-handling equipment can make large savings in your plant, too. Write for complete information.**

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**The most economical way to handle material is NOT to HANDle it**

FIG. 5—In three overhead bins, similar to the flashing bins, are stored the cleaned and crushed chips and turnings. By chutes, the scrap subsequently is loaded in gondola cars for shipment

suspended from the trolley in such a manner that with 20 pounds or one-half of a load of flashings in the basket it will not trip the limit switch at the hoppers. This prevents doubling up a load on a basket. When empty, the basket is lifted by the spring into position so that its lugs make contact with the hopper lugs and the basket will receive a load.

At present, the basket trolley is operated at a speed of 5 feet per minute. It is driven by a 1½-horsepower, 1200-revolution per minute motor through a speed reducer and variable-speed transmission unit of the block-belt and variable-diameter sheaves type. Through this the chain can be operated at any speed between 5 and 16 feet per minute, thus providing for practically tripling present operating capacity. Additional loading stations may be installed whenever the necessity should arise.

### Use Block-Link Chain

The 6-inch pitch chain is of supermalleable iron of the flexible block-link type. The trolley bearings are provided with a dust seal with provision for pressure grease lubrication.

The mechanism for emptying or discharging the conveyor baskets into the proper storage bins is similar to that for emptying the hoppers into the baskets. The projecting lugs on the loaded baskets make contact with the proper pin thus releasing the latch on the bottom of the basket and emptying it in the bin. With the weight released, the bottom closes and latches automatically. Also, as mentioned previously, when the load is released, the spring tension raises the basket lugs in position to contact lugs at the loading hoppers.

### Shipments Made Regularly

By this spring arrangement loaded baskets pass by the loading hoppers and empty baskets pass over the storage bins without making contact. The installation has been in operation about two years and has required much less maintenance and given less trouble than had been anticipated.

A 50-ton car of scrap is produced every 22½ hours of operation. Thus a storage bin is emptied about every other day. The three types of scrap are produced in proportions of approximately 43 per cent carbon steel, 37 per cent nickel steel and 20 per cent chrome steel, thus necessitating somewhat uneven loading of cars of the different materials.

These covered outside storage bins, Fig. 4, are built as a unit, side by side, each about 10 x 11 feet in cross section with 20 feet of storage depth. The sloping bottom permits emptying into an open gondola by a chute or apron.

An advantage of this system is that flashings are not handled by hand after they leave the trimmer's tongs. Practically all flashings in this plant are relatively small so that they may be placed in the bucket at the elevator as they are removed from the trimming presses. An exception is the flash from the transmission shift lever, which is too large for the bucket. Although it could be cut to smaller size, it is loaded on a truck and handled separately.

### Method Is Economical

The installation is said to be operating satisfactorily and at a cost of between 6 and 7 per cent of the estimated cost of trucking the flashings from the trimming presses and loading them on the cars. The latter procedure would necessitate either excessive storage on trucks, rehandling, or keeping 3 cars on the side track for a week or more until

(*Please turn to Page* 81)

FIG. 6—Chips and turnings from the machine shop are collected in pans and carried by a crane truck to temporary storage bins at the oil extractors. Freed of oil, the chips are crushed, then go by bucket elevators to the storage bins shown in Fig. 5

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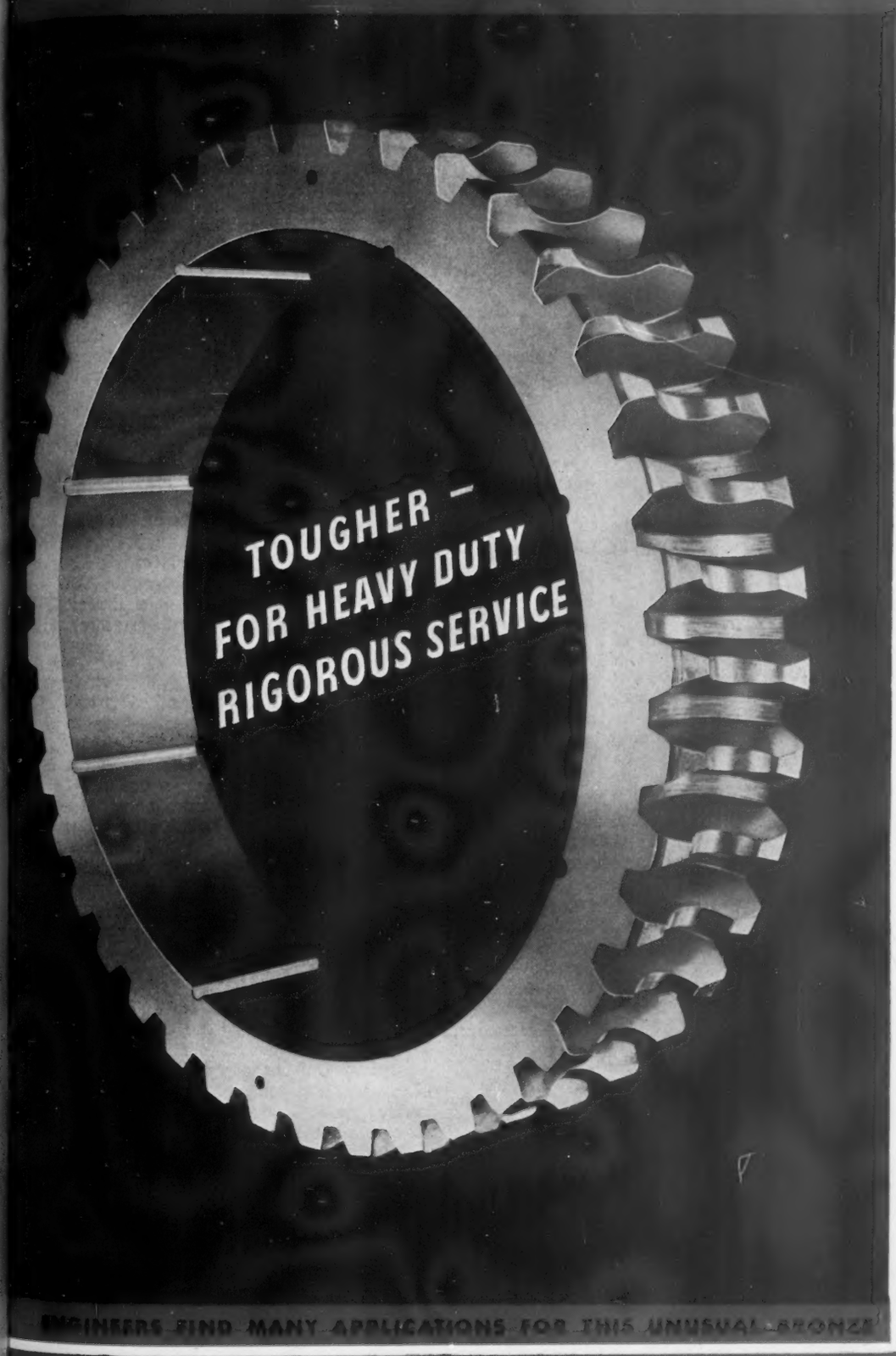
LONGER LIFE · LOWER COST




ENGINEERS FIND MANY APPLICATIONS FOR THIS UNUSUAL BRONZE

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**DHS Grade No. 2**

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| Ult. Ten. Str., psi. | 115,000 min. |
| Yield Point, psi. | 90,000 min. |
| Elastic Limit, psi. | 55,000 min. |
| Elongation in 2", % | 12 min. |
| Reduction of Area, % | 12 min. |
| Brinnell Hardness No. | 225 min. |

*For all applications where lineal contact speeds do not exceed 250 feet/minute.*

This D H S #2 Bronze Worm Gear is 43½" O. D.; 7¾" face; 40" P. D.

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# WELDING, ETC.

## BY ROBERT E. KINKEAD

### Best Results Obtained with Correct Size Welding Rod

WITH a probable consumption of arc welding rods of 170 million pounds for 1937 it might be expected that more attention would be paid to the subject of proper current for different rod sizes.

Manufacturers of the welding rod print on the package the maximum and minimum currents which may be used on the rods contained in the package. But the manufacturer undertakes no responsibility for optimum results. In most cases, the maximum and minimum currents represent the broadest claims of the least conservative member of the competitive group of manufacturers who sell welding rod.

In spite of this confused condition of labeling welding rod, there is in fact a narrow range of current for each size welding rod in which the best results in the long run are obtained. Thus, in the case of a certain ¼-inch diameter, coated welding rod, very poor results are obtained with a current of 500 amperes. The results get better as the current is decreased to 225 amperes, and then start to get worse as the current is reduced below that point. The same make of welding rod will give excellent results on 500 amperes if ⅜-inch diameter welding rod is used. There is a normal range of currents for each size welding rod—but that is not the range printed on the package.

A similar situation exists with reference to arc length. An expensive coating is put on the welding rod to shield the molten metal from the atmosphere. The shield operates successfully if the arc is not too long.

The correct welding current for any job is always found by giving the job all the heat it will stand. But the weld metal will not be the best that can be obtained unless the welding rod size is correct for the current used. The fact that large diameter welding rods cost considerably less than the small diameters is a convincing argument for their proper use.

IN this column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL

• • •

### Mellon Has a Philosophy

IT HAS been a hobby of this writer for many years to search for paragraphs in the speeches and writings of living men which are complete, perfect in construction and express a philosophy of living which is significant. Hitler, Mussolini, Stalin, Roosevelt, Chief Justice Hughes and others are worthy of study in this connection. Men of great wealth are often inarticulate; when they speak without benefit of public relations counsel frequently create a bad impression. In the present welter of exhoration and public preaching it is interesting to speculate what is on the minds of the really great capitalists and financiers. What is their answer to Hitler; to Stalin, to Roosevelt?

Andrew W. Mellon, who with his brother gave something over ten million dollars to establish the Mellon Institute of Industrial Research, in his recent dedication speech seems to have unconsciously answered with a philosophy of living stated in one sterling paragraph.

> "I have been very happy to have a part in this work and feel it has been a great privilege for my brother and me to provide this place where men of science can come in their search for new ways to increase the usefulness of industry, to promote health and so improve the common lot of all. It is science, not governments or wars of conquest, that opens to us new horizons; and as Dr. Duncan so truly said, the new processes and new powers which science will discover will in the future give men the chance to live and to live more abundantly. If this institute can contribute, even in small measure, towards this end, all of us here today can feel that our efforts will not have been in vain."

Our own reaction is that the directors of the institute would do well to carve the words of Andrew W. Mellon in large letters in the wall of the building. Nothing future scientists will discover in the institute will be more important than the wisdom therein expressed.

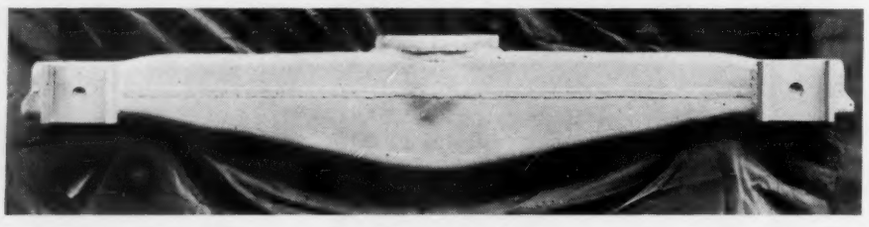
• • •

The City of Cleveland, through its building commissioner, issues permits for welded building construction under provisions which have proven safe over a period of several years. The commissioner requires that the drawings be signed by a qualified welding engineer and inspector. The engineer takes responsibility for weld design and the inspector for seeing that the designed welds are executed.

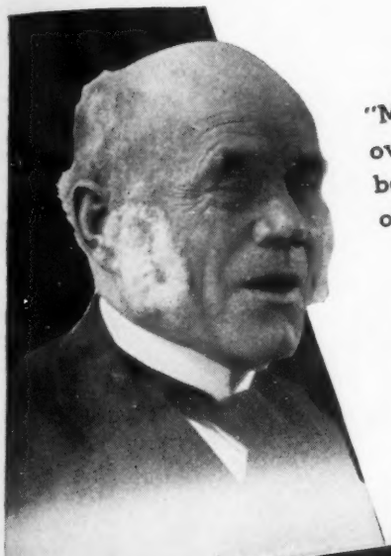
• • •

"Welding Instructions and Standards," issued by the Carnegie-Illinois Steel Corp., Pittsburgh, for use of the company's own welding shops, is a complete and authoritative guide for engineering office and shop in the proper use of welding. This company employs 350 to 400 welding operators on maintenance service alone so that standardized welding practices are necessary. The work fills the gap between the engineering office and the shop that exists in many industrial organizations. Using these instructions, the engineers cannot merely tell the shop to "weld it." The instructions provide symbols and specifications so that the engineers must specify precisely how the shop is to perform the welding operation.

### New Bolster Meets Specifications

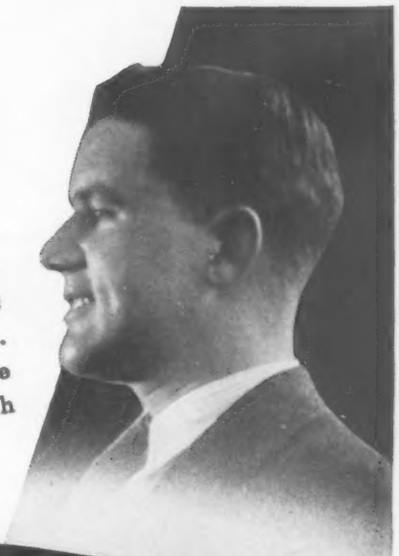


ASSOCIATION of American Railroads specifications have been met with the manufacture, by United States Steel Corp. subsidiaries, of a satisfactory rolled and welded steel truck bolster, upon which the entire weight of a freight car super-structure rests. Fifty sets of the new bolster have been approved for use, 25 for cars of the Pennsylvania railroad and 25 for ore and coalcars of the Bessemer & Lake Erie railroad

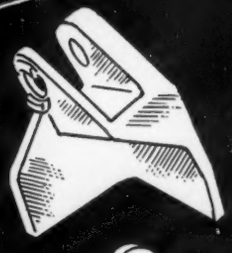


"My production game is 'way over par, Lad. Too many *strokes* between the *tee* square and the *output!*"

"You're using the wrong *iron*, Pop! Here's how to keep out of the mould-ing *sand traps* and defect *hazards* ...cut out those machining *slices*... and put hard-cash *eagles* on the score card. Drive 'em straight with welded steel!"

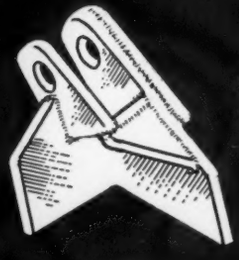


## *Sketchbook of Welded Parts*

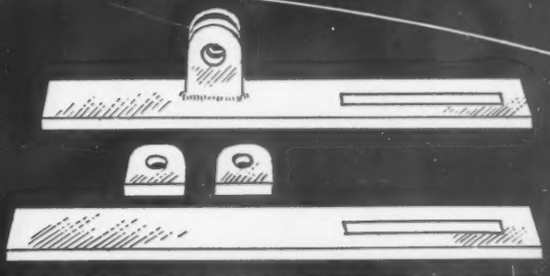


$4.39—Cost of the superseded cast steel bracket.

Component parts of rolled steel for welded design.



$2.95—Cost of the new welded steel bracket.



**LESS MACHINING NOW**—Formerly cast, it was necessary to drill the bearing bosses of the lever individually. Now of welded steel design, rolled steel bosses are drilled in stacks of 25, then welded to the rolled steel lever. Costs are 40% less than the old way

**MADE FROM BAR STOCK**—This lever required a sharp corner to reinforce the bearing hole. It is welded from two pieces of bar stock, one of which is sheared with bevelled end, giving a V for a flush butt weld. It's cheaper than casting by 30%.

Write for Machine Design Application Sheets. Issued Periodically.

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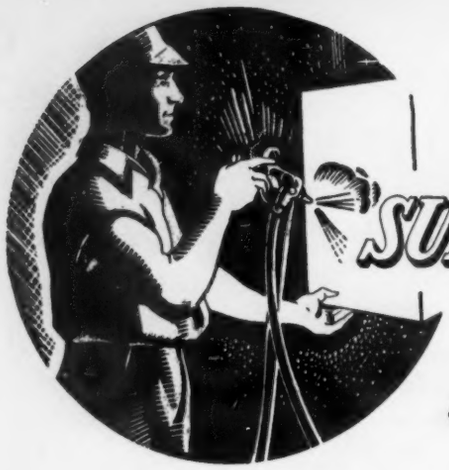


# SURFACE TREATMENT AND FINISHING OF METALS

## Porcelain Enamel Earns Prominent Position in Modern Architecture

IT IS not long since porcelain enamel was mainly a "kitchen favorite". Its possibilities then came to the attention of architects and in past years it has gained popularity in household appliances and industrial equipment fields. Now it is making favorable inroads into the building construction industry. Its esthetic and utilitarian values are best illustrated by the many installations which have attracted wide attention. Prominent among these are store fronts, store interiors, theater facades, outdoor signs, filling stations, food marts, marquees and house roofs.

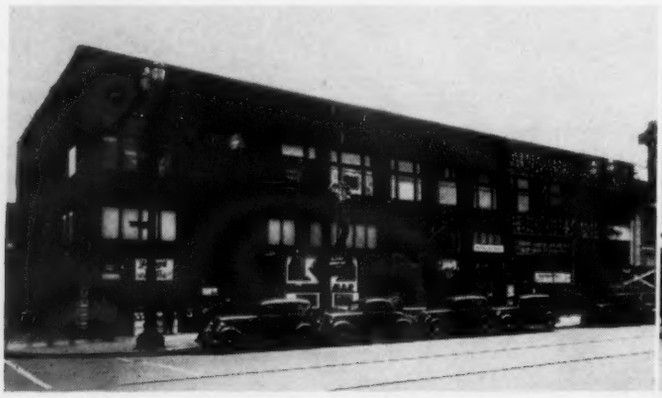
Many installations are in color, including white, blue, green, black, yellow, brown, and orchid to name the most popular. It is possible to duplicate the entire color range of terra cotta and to effect beautiful pastel shades with almost any desired degree of gloss. The colors will not fade or tarnish nor will the enamel flake or peel from the metal surface. Porcelain enamel is a glass product produced entirely from inorganic materials. Earthen ingredients are smelted together at a temperature of 2650 degrees Fahr., quenched in cold water and then milled to a fine powder. This powder is made into a "slip" with water and a few additional agents, sprayed on sheet steel and fused to the surface at 1650 degrees Fahr.

The federal government recently made a survey of 1,500,000 stores and discovered that 90 per cent needed new fronts. This figure does not include the great number of hotels, hospitals, theaters, filling stations and apartment houses which will have to modernize or go out of business. Examples of dilapidated, outmoded buildings which are out of step with modern style trends exist on every side.

Insurance companies have found it to their advantage to modernize buildings under their control. Newer buildings offer leasing competition which can not be overcome with unkempt, unpolished structures. As in other industries it is the smart, modish looking appearance which attracts potential lessees into the interior to make inquiries.

Since the street frontage of a store is the most valuable sector of the entire establishment its appearance is of paramount importance and meaning. Experience and practical necessity stress a front which includes built-in illumination, display and advertising. The front

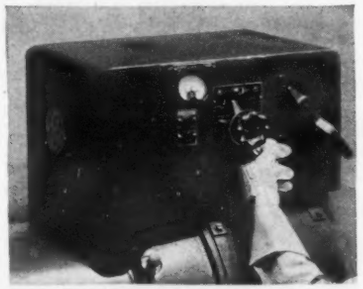
**APPEARANCE of an entire building can be changed from the drab structure shown left to the smart store building shown right by use of porcelain enameled steel. Building shown here was remodeled with enameled sheets supplied by Enamel Products Co., Cleveland**



THE ONLY SET THAT MAJOR ESSENTIALS FOR

# THE ONLY SET THAT GIVES USERS ALL 3

1 THIS



Simple, easily adjusted control

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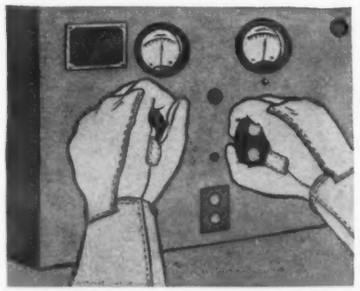

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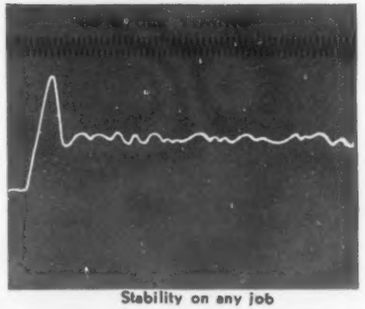
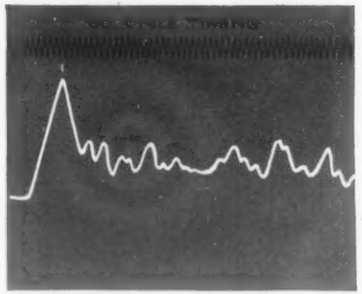


Stability on any job

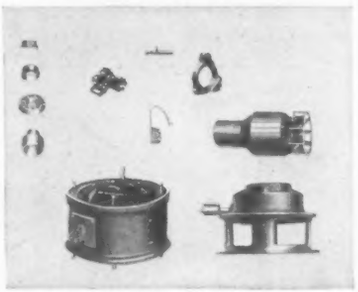
NOT THIS



3 THIS

Only two brushes for excitation

NOT THIS



# MAJOR ESSENTIALS FOR MAXIMUM WELDING PROFITS

1 **Simple Duplex Control** provides quick, easy adjustment to suit each job, whether thick, medium, or thin material is being welded, and whether the welding is being done in the overhead, vertical, or downhand position.

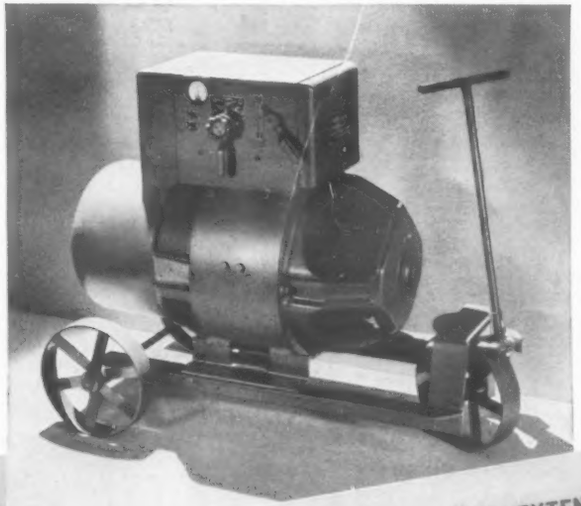
AND

2 **Adequate Self-stabilization** paves the way for speedy, high-quality production. The stable, "peppy" arc makes excellent results easy to obtain with all sizes of electrodes — either bare or heavily coated.

AND

3 **Dependable Self-excitation** gives added assurance of continuous availability for productive work, and maintenance of a separate exciter is eliminated.

## IN NO OTHER SET CAN YOU GET ALL 3



Doubtless you are obtaining *some* profits from your fabrication and repair work, but are you getting *maximum* profits? G-E arc-welding distributors and specialists are in the best position to help you obtain maximum profits because they represent the world's most extensive user of electric welding and offer the largest variety of equipment on the market.

If we may be of service to you, get in touch with the nearest G-E representative. He will be glad to help you. General Electric, Schenectady, N. Y.

GENERAL ELECTRIC

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BACKED BY GENERAL ELECTRIC, THE WORLD'S MOST EXTENSIVE USER OF ARC WELDING

**INDIVIDUAL store fronts can be modernized without remodeling entire building. Striking change effected here illustrates what can be done with this modern architectural medium. Photo courtesy Enamel Products Co., Cleveland**

must have a high degree of attention value or lose its purpose. Porcelain enamel on sheet steel has been found to be an excellent medium with which to attain this value. It also caters to remarkable possibilities in design. For light reflection it is an outstanding substance.

Porcelain enamel fronts are permanent and easy to maintain. They can stand a tremendous amount of abuse and even though they consist of glass fused on steel their resistance to physical violence or impact is high. They are little effected by rust, tarnish, fading or wear. There are porcelain enamel coverings still extant which were installed more than fifteen years ago. Rapid changes in temperature, fire, smoke or water do not affect either material or luster.

**Organize Fabricators**

To aid local companies in this rapidly growing field Designers For Industry, Inc., Cleveland, has formed a group of fabricators and erectors into units known as Luminous Building Affiliates. It acts as consultant to these affiliates in matters pertaining to fabrication, erection and sales as well as design. These affiliates are in every large city, or will be as soon as the system is completed. A design and sales representative is located permanently with each affiliate. In this way the designer can create and supervise erection and see to maintenance.

To conform to community usages each affiliate co-operates with local agencies interested in better buildings. These include architects, real estate departments of insurance companies and banks, federal housing administration, real estate boards, and merchant associations.

A business avenue is as smart looking as its dress. A well lighted, varicolored thoroughfare attracts people. People bring more business and reputation to an avenue. In modern architecture porcelain enamel on steel has earned for itself a deservedly prominent place. From a pioneering possibility it has become a practical medium to building companies. Its beauty, durability, low cost of installation and maintenance and prolonged smartness have firmly secured it as a building material.

# Machine Bails Zinc from Galvanizing Kettles Safely and Economically

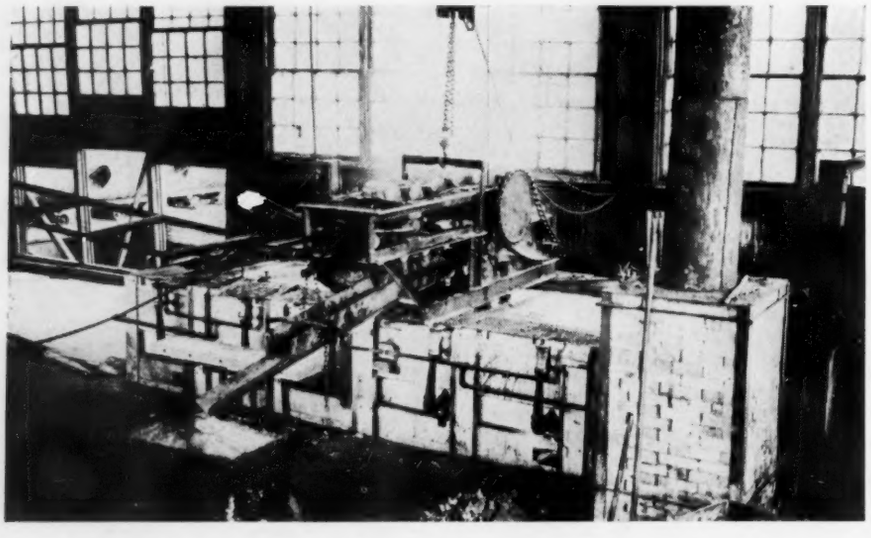
NEED for speed with safety to operators when molten zinc is being removed from a galvanizing kettle, has led to the development of a patented zinc dipping machine which has been in practical use for over a year in a mill where there are several zinc kettles and lead pans.

The zinc dipping machine is in reality an adjustable, substantially built, motor-driven bucket conveyor and will remove zinc at the rate of a ton a minute from a galvanizing kettle. Essential features are the ability to adjust the depth of the conveyor at any time and to maintain a discharge of the hot metal into the trough without splashing. The machine in its entirety weighs about 1200 pounds and is readily portable from kettle to kettle.

The hot metal is allowed to run into cast iron chills, which preferably are shaped to represent the cross-section of the kettle. As soon as the molten zinc has solidified sufficiently, a large hook is inserted in the metal and remains in place as the metal solidifies, so that the ingot can be lifted and placed in the kettle when desired.

In the plant where the machine was developed and is in use, it is said that it has permitted a saving of about $5000 a year, not only in direct labor savings, but also in reduction of operating time for zinc kettles and lead pans. The machine could be used for similar work on any of the low melting-point alloys or metals.

Those responsible for the development of the machine are willing to share its advantages with others. Full details may be obtained from Hanson - VanWinkle - Munning Co., Matawan, N. J.



**PORTABLE bailing machine illustrated here removes molten zinc from galvanizing kettles with complete safety and economy**

# PROGRESS IN STEELMAKING

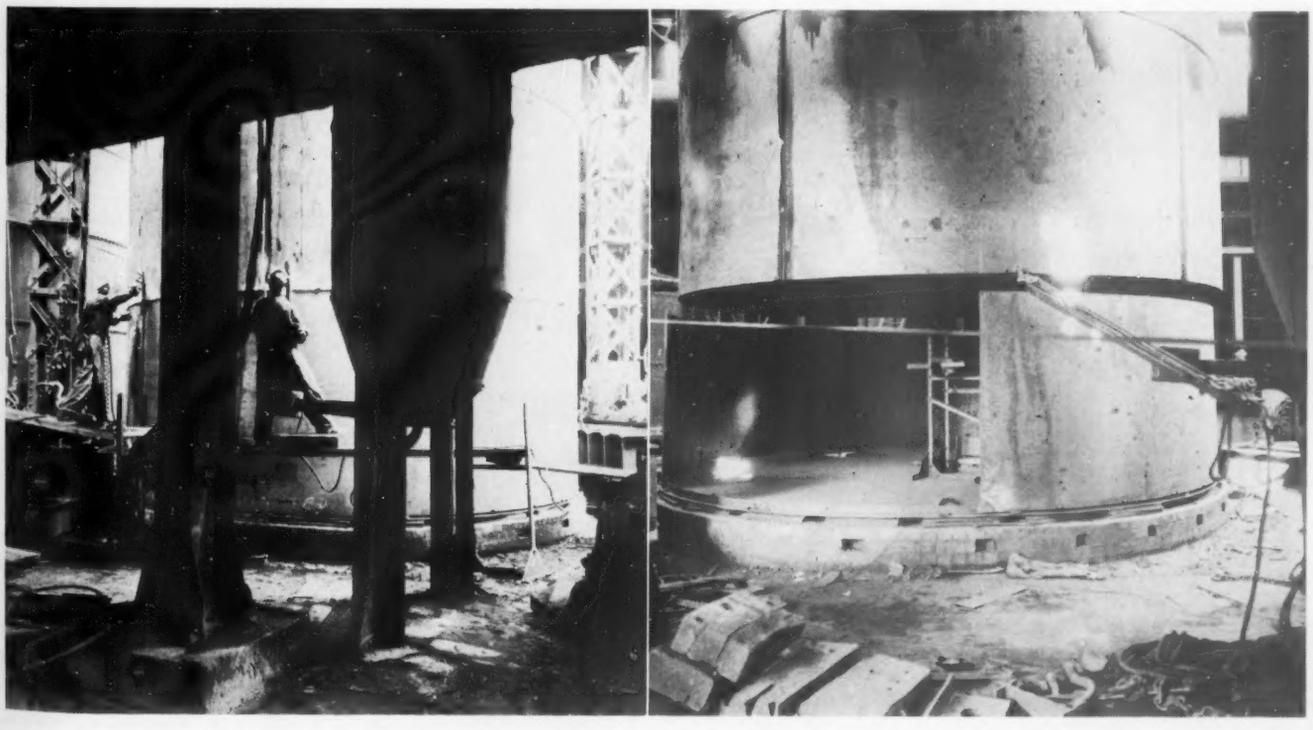
## All-Welded Blast Furnace Stove Operated at English Plant

BY H. M. HENDERSON
Manager, Steel Construction Department, Appleby-Frodingham Steel Co., Ltd., Scunthorpe, Lincolnshire, England

WHAT is said to be the first all-welded blast furnace stove of its kind in the world has been operating successfully for over a year at Nos. 5 and 6 stacks, Appleby works, of the Appleby-Frodingham Steel Co., Ltd., Scunthorpe, Lincolnshire, England. Each of the stacks originally was served by three stoves of riveted construction. In 1933, however, it was decided to erect a seventh stove which could be used to serve either No. 5

**Fig. 1—Welders engaged in joining ring of plates to the shell suspended from two steel derricks**

**Fig. 2—Bottom angle ring anchored to stove foundation served as a jig for assembly of each tier**



# GLEAMING=

*with the*

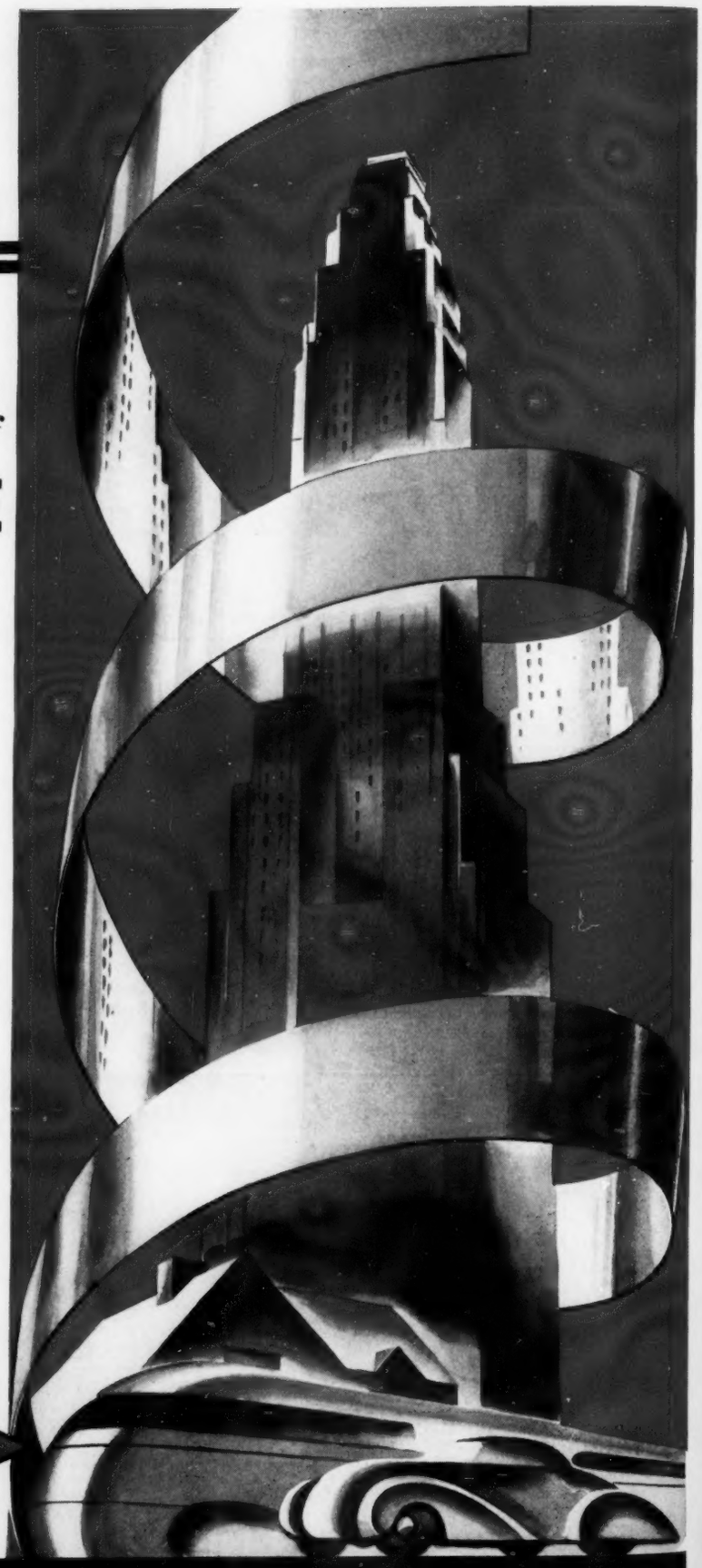
# ASSURANCE *of* PERMANENCE

A product that gleams and sparkles with freshness is not only good to look upon, but it carries a suggestion of cleanliness. Buyers have indicated a preference for that type of product—particularly when the gleam carries a definite assurance of permanence.

Manufacturers can give this assurance—and many are doing so—with SUPERIOR Stainless Strip.

SUPERIOR Stainless is backed by 50 years' experience in the manufacture of Hot and Cold Rolled Strip Steels. Ahead lies our determination to render the best possible service to users of stainless and carbon strip steel. Improvement of our product is our watchword. Improvement of your product is possible through the use of SUPERIOR Strip.

Let our engineers tell you how!



Superior STAINLESS STRIP Steels

**SUPERIOR STEEL CORPORATION**

GENERAL OFFICE: GRANT BLDG., PITTSBURGH, PA. WORKS: CARNEGIE, PA.

or 6 stack as the occasion required.

Considerable experience had been gained previously in the repair of stoves by welding, particularly where corrosion had obliterated rivet heads on the inside of the shell. As this experience had been entirely satisfactory it was decided to construct the new stove by welding.

IRON ORES mined in the district in which the Appleby stacks are located are said to be the leanest commercial grades in the world. Ores mined in the Birmingham district, Birmingham, Ala., contain from 35 to 40 per cent iron whereas the Frodingham "iron stones" average about 23 to 25 per cent.

William A. Haven, vice president, Arthur G. McKee & Co., Cleveland, now in Scunthorpe, England, in connection with the construction of two new blast furnaces, which his company is building, writes as follows:

"The Frodingham stones are slightly more than self-fluxing so far as silica is concerned. Another lean ore containing about 30 per cent iron and an excess of silica is employed to produce a proper slag. This ore comes from the neighboring county of Northampton, the Frodingham deposit being in Lincolnshire. The proportion used at the Appleby-Frodingham stacks is about two of Frodingham stone to one of "Northants" stone.

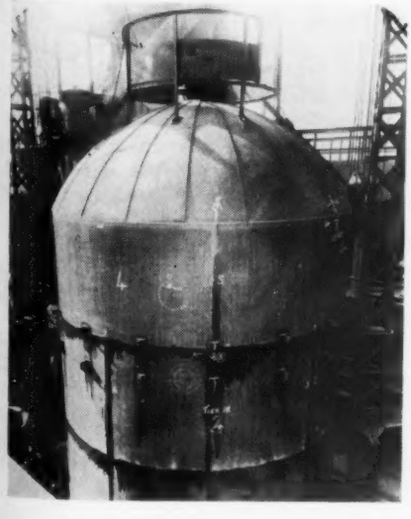
"Considering the large quantity of slag produced, about 2900 pounds per ton of pig iron, the coke consumption is not as high as might be expected. It averages from 2700 to 3000 pounds per ton of pig. The top gases, however, are in most cases rich, which indicates that, with larger furnaces and improved preparation of the ores, physically, a substantial reduction from these figures should be obtainable. Better coke practice, larger output per stack and more uniform quality of metal will be obtained when the two large stacks of essentially American design are completed."

The stove shell is 20 feet diameter and 99 feet high, constructed of 5/8 and 7/16-inch thick plates lap welded. This obviated the necessity for exact allowance for contraction in welding. Blue asbestos covered electrodes of No. 8 gage (0.160-inch) were used for all welds. The site was congested, as can be seen in the accompanying illustrations, access for any large pieces being available only from above from the raw material bunker gantry.

The bottom with the internal angle welded to it first was put on the foundations in its correct position. The top tier and dome were then built up on the bottom and welded. This top section was next picked up by two stationary derricks and lifted to a height which allowed the second tier of plates (counting from the top downwards) to be assembled in place on the bottom angle ring. The latter acted throughout as a jig for the assembly of each tier. This position is shown clearly in Fig. 1. The top then was lowered to pick up circumferential tacking holes, the whole tier being bolted up tight at about a 2½-foot pitch. Wherever any gap showed between the plates this was taken up by bolting a bridge piece to the adjacent tacking holes and driving in wedges, as shown in Fig. 2.

Welding then was commenced on the horizontal seams working out from the center of each plate to the edge; vertical seams were next welded, the tacking bolts at the bottom angle ring taken out and the structure was ready for the next lift. The position of the lifting lug was lowered 20 feet after the seventh lift. The erection and site welding was completed within five weeks from commencement.

**Fig. 3—Top of welded shell showing dome construction and method of suspension from derricks**



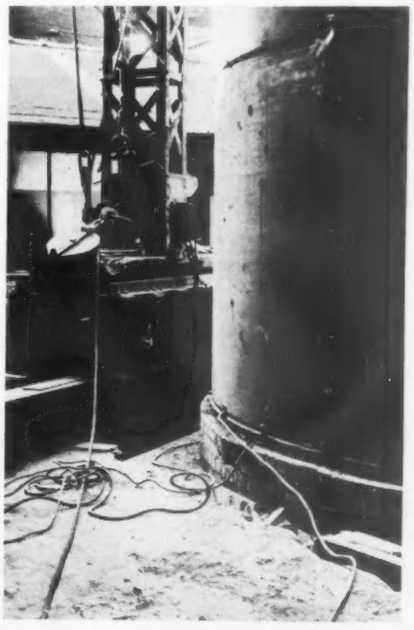


**Fig. 4—Gaps between plates were eliminated by bolting a bridge piece to adjacent tacking holes and driving in wedges**

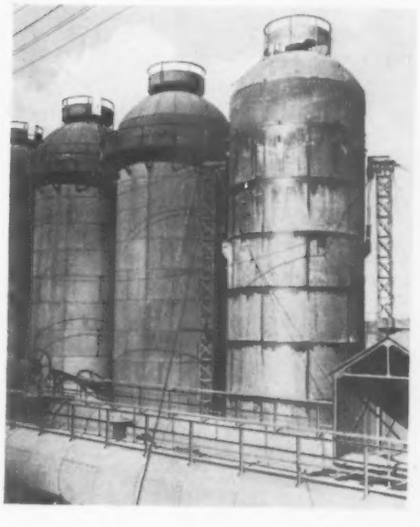
## Issue Report on Career in Metallurgical Engineering

As a result of its recent survey in the field, Institute for Research, 537 South Dearborn street, Chicago, has announced publication of its monograph entitled "Metallurgical Engineering as a Career."

Of undoubted value to students or young men interested in this field, the publication gives an introduction to metallurgy with the history and development of metallurgical engineering. Steps in the production of iron products are discussed and the importance of the metals industry. Along with this are presented the attractive and unattractive aspects of the career followed by personal qualifications and education required. Opportunities and different types of positions are then outlined, along with lines of promotion, working conditions, and salaries in metallurgy.

A typical day in operation work, a day's work in a routine laboratory and a day's work in a research laboratory are described and a bibliography included at the end of the booklet. Reflecting a thorough research, the publication presents a broad and interesting picture to those interested in a career as metallurgical engineer.

**Fig. 5—Welded shell completely erected and ready for installation of walkway and platform**



# Grind Eight Valve Seats at Once

CAPABLE of grinding eight valve seats at one setting is a vertical machine developed by Hall Mfg. Co., Toledo, O., and installed for Ford Motor Co., Dearborn, Mich. Designed to handle the Ford V-block from both angles, the new machine grinds eight valves in the first position. Spindles are then raised by the main lever and the shift lever is thrown over, moving the block the distance between two valve centers. Heads are then lowered again and the other eight seats are ground. Feed for grinding is automatic or hydraulic; feeding down to a limit stop. During grinding or dressing of wheels a suction system carries away all dust.

In order that grinding wheels may be dressed by the shifting of a lever, the eccentric travel is thrown out of mesh so the high point of eccentric action stops, all at exactly the same point. Grinding wheels then run concentric with the eccentric shaft standing still. While running in this position, the diamonds used for dressing are passed across all at once, hands being used on two cranks. The diamonds do not require adjusting each time a dressing takes place. Since these heads come down on an angle against definite limit stops on the diamond dresser, the limit stops are moved one notch, which allows the grinding wheels to drop 0.004-inch farther than usual. When the diamonds are passed across the face, this 0.004-inch is removed from the wheel, bringing all grinding wheels to exactly the same depth. A master indicating gage is mounted on the diamond dresser pilots to set new wheels to correct depth when first installed.

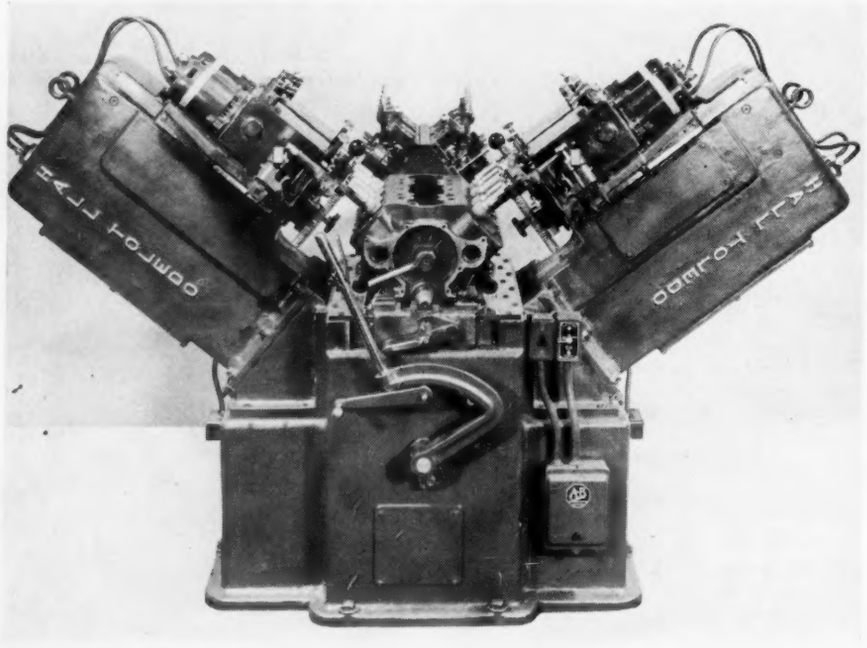
Motors are usually of 180 cycle, 220 volt type, although universal current motors of equal speed may be used where high cycle current is not available. Wear on eccentric shafts necessitating replacement has been lessened, although even when worn there is true concentricity due to gyroscopic effect obtained from floating spindles. Eccentric shafts run at 32 revolutions per minute while the outer spindle runs at 10,500 revolutions per minute. Lower eccentric shaft and outer wheel carrying spindle both float laterally to a total of 0.040-inch, allowing grinding of valve seats where the guides, into which pilots are mounted, are off centered either way 0.020-inch.

Feature of the machine is this allowing of two shafts—both offset from each other in parallel relation—to run at this speed without vibration. Problem was complicated not only in the high speed shaft but in the fact that there was an inner slow speed shaft, which interfered with the high speed shaft and made it almost inaccessible for applying any joint thereon. Difficulty was overcome, however, by a triple-looped spring drive. With upper spindle being definitely on dead center pilot in the valve stem guide hole could be off center in parallel relationship and could be cocked slightly on an angle so the upper end of the pilot did not move over from dead center more than 0.020-inch. Factories can now maintain valve stem centers, anywhere from 0.003 to 0.015-inch, which is within range of the machine.

In use, sixty blocks per hour is a good average, with one man grinding all sixteen seats. In actual tests all sixteen seats have been ground in as fast as fifty seconds—block to block. General average, of course, is somewhat slower. The Hall Mfg. Co. is planning to build these machines in one, two, four, six, eight or twelve spindle sets. As a result, a twelve cylinder job will take no longer to grind than an eight, six or four and the operator can obtain the same accuracy that he could on four or two.

Gear boxes are interchangeable and, in case anything goes wrong with one box, a new box can be fitted to the crosshead in about ten minutes. The center of these boxes is held accurately within 0.001-inch both for height and lateral position. Although machines are built special to suit requirements of each factory, in event a factory changes its motor, it is possible to send gear boxes back to the manufacturer to revamp to new centers.

**IN two operations this Hall-Toledo machine can grind sixteen Ford valve seats in fifty seconds**

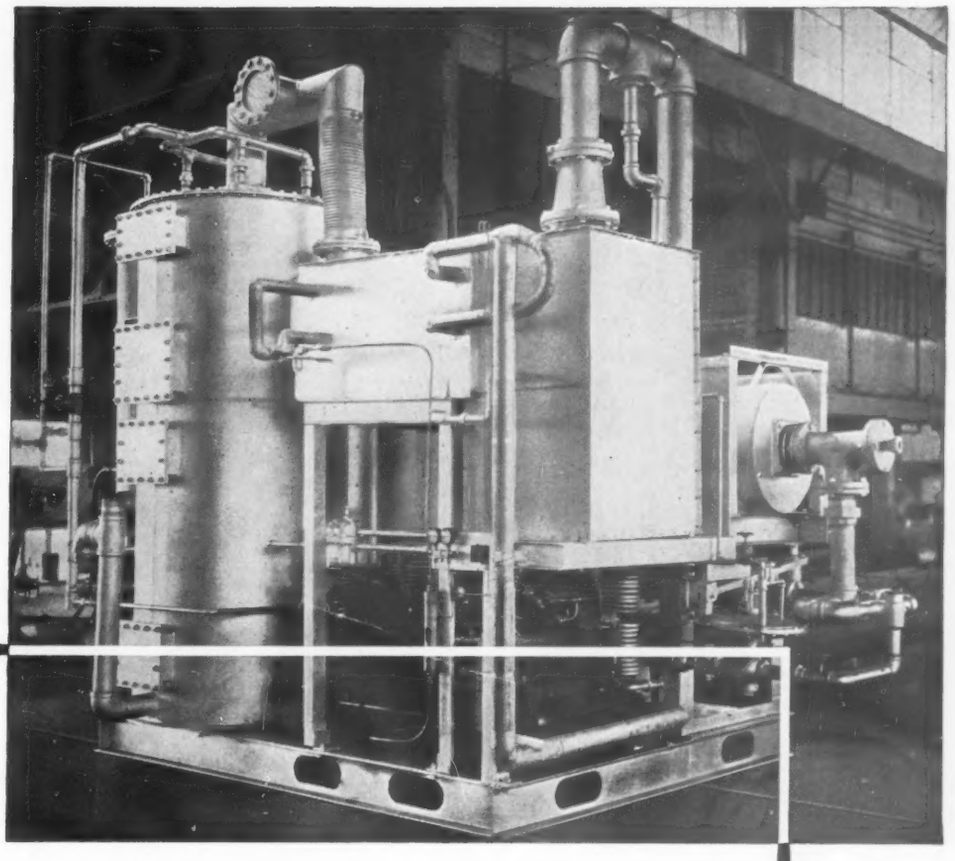


## Develops New Ink for Use On Recording Instruments

Bart Products Co., Bartlesville, Okla., has developed a new ink for use on recording instruments. It has the property of making a continuous line on paper charts under a wide range of humidity and temperature conditions. As a result of behavior in extensive tests, the ink has been tradenamed "Round-the Chart" for the reason that it goes completely around the chart without failure.

## Washer Chart Is Available

Wrought Washer Mfg. Co., Milwaukee, has announced the publication of a special washer data chart printed on heavy index bristol and suitable for hanging in stock room, warehouse or engineering or production department. The new table contains complete size and dimension data of the entire range of standard wrought washers including inside diameter, gage and fractional equivalent and pieces per pound. The more frequently used washers are illustrated actual size, enabling easy identification of a washer of unknown size by holding it against the printed illustration. The chart was designed to save time and prevent the selection of wrong washer sizes for a given production or maintenance job.



# GAS

## Makes Controlled Furnace-Atmospheres Practical and Economical . . .

The possibility of improving the quality of products and reducing production costs by using controlled furnace atmospheres has long been recognized by engineers. Its use is now extended to a wide variety of industries.

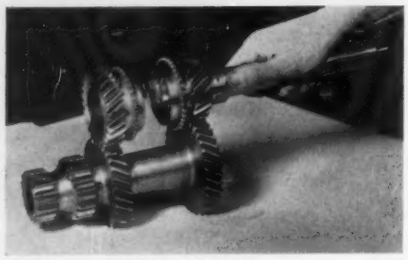
With Gas, such controlled atmospheres are easily possible, on a practical and economical basis, and once again, gas has proved its right to be known as The Modern Industrial Fuel.

Machines now make atmospheres (from natural or manufactured gas) for a wide variety of heat treating operations and deliver them under accurate control to the work being treated. And gas fuel heats the work exposed to these atmospheres—heats it uniformly and makes a better quality work than ever before. These results are helping hundreds of manufacturers to improve their products, reduce over-all costs and increase their profits.

You, too, will want to enjoy all these new advantages of modern gas utilization. Call your gas company industrial engineer for complete information about how gas can help make profits in your plant. Call today—no obligation, of course.

**AMERICAN GAS ASSOCIATION**

INDUSTRIAL GAS SECTION: 420 LEXINGTON AVENUE, NEW YORK CITY

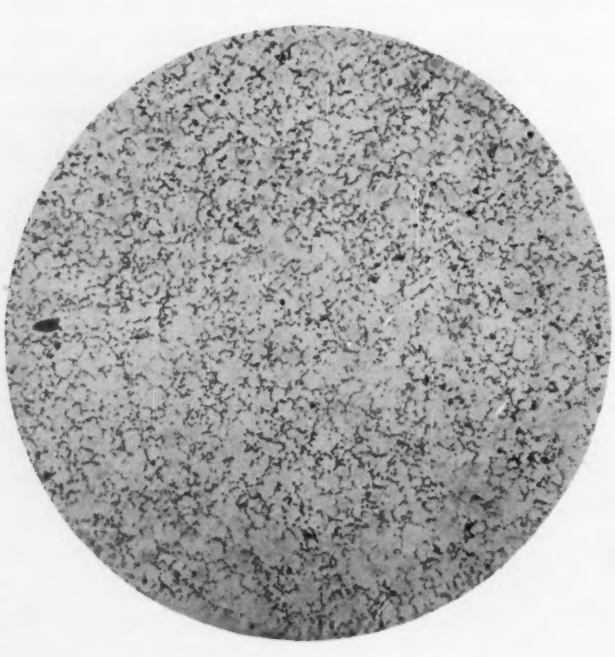


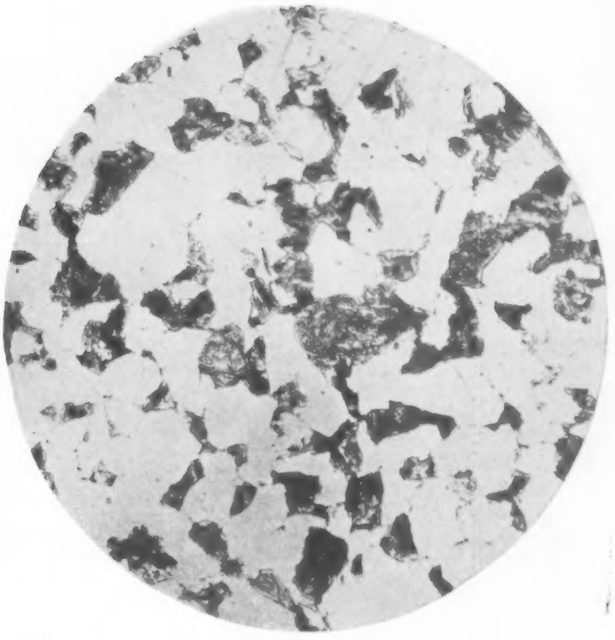
# Chrome-Molybdenum Carburizing Steel Cuts Production Costs

INTRODUCTION of hypoid gears in the rear axle assembly of numerous 1937 model cars solved beautifully the carmakers' problem of eliminating floor tunnels without raising the body any higher. These innocent appearing little gears have proved, however, to be one of the greatest headaches in recent years for producers of automotive steels and their lubricants. As a result of the extreme angle through which these gears drive, pressures are reached much higher than any ordinarily used. Ordinary lubricants squeeze out, and even with the specially designed lubricants now offered by most oil companies care must be exercised to prevent direct metal to metal contact with resultant "scuffing" or wearing of rough, uneven spots on the gears with ultimate failure resulting.

Naturally the car-builders turned to the steel industry with demands for a steel with the desirable properties of the carburized steels, which could stand the gaff in this type gear, without their prohibitive cost. Recently the Climax Molyb-

**PHOTOMICROGRAPH at left shows grain size of the 4120 steel, A.S.T.M. standard E19-33, sodium picrate etch. Right view shows direct quenched case structure. X1000**





**LEFT view shows direct quenched core structure, X500, while photomicrograph at right shows the new steel in the normalized state at 1700 degrees Fahr. at the same magnification**

denum Co., 500 Fifth avenue, New York, announced its solution to the problem in a new steel, not yet officially classified by the Society of Automotive Engineers, but tentatively known as S.A.E. 4120. The new product is a chrome-molybdenum carburizing steel, developed to provide a low-cost steel for those applications where the core properties of the expensive carburized steels are not essential. Core properties are equal to those of more expensive alloy carburizing steels, it is stated, and it is available on a tonnage basis.

When the 4120 steel is made to controlled grain size, characteristics from a production standpoint include quenchability directly from the box with a minimum uniform distortion; hard, wear-resistant case; good core properties; excellent machinability. Low raw material cost enables this product to take its place in that gap which separates carbon steels from high-alloy carburizing steels according to the company.

### Distortion Is Slight

Minimum predictable distortion has been shown by a series of tests, according to the company, and parts of complicated section show a uniformity of distortion. Distortion in a variety of differently shaped parts has been shown so slight that little or no finish grinding is necessary, even with close tolerances.

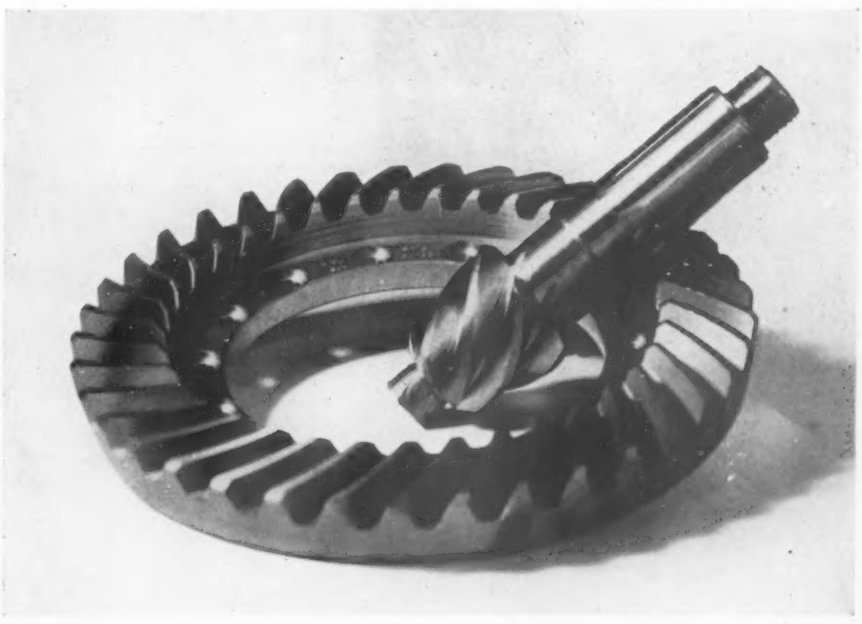
Since comparatively little untransformed austenite is retained in the case, this steel takes a hard and wear resistant case. Although there is a greater proportion of wear resistant carbides, the case will be free from excessive grain boundary carbides when proper carburizing temperatures are employed.

Series of tests have shown the new steel machines well on a production basis, and is easily annealed to proper quick machining hardnesses. Ultimate strength of various specimens tested ranges upward to 166,000 pounds per square inch, with yield points up to 145,000 pounds per square inch.

Many applications for the new steel have already been brought forward, according to its makers, including medium and heavy duty gears and pinions, sucker rod couplings, chafts and antifriction bearings in addition to the application in hypoid gears as previously discussed.

## Joist Spacing Scales and Design Tables Announced

Architects, engineers and others will be interested in a new set of twelve concrete joist spacing scales and design tables recently prepared by the Universal Atlas Cement Co., Chicago. The joist spacing scales will enable the designer or architect to determine quickly the width of spacings and lay them out. The tables on these scales also show the necessary design data to make computations of depth of joists and slabs, and the bar sizes required for the sections selected. Tables are based on the latest approved Code recommendations of the American Concrete Institute. Cuts of these scales and tables are available from the company.



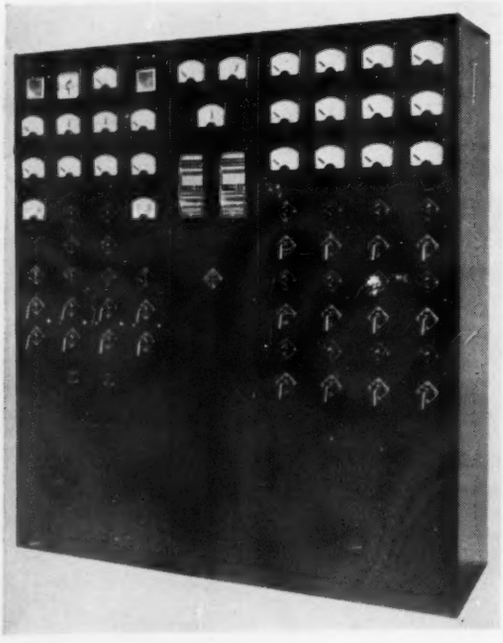
# POWER DRIVES

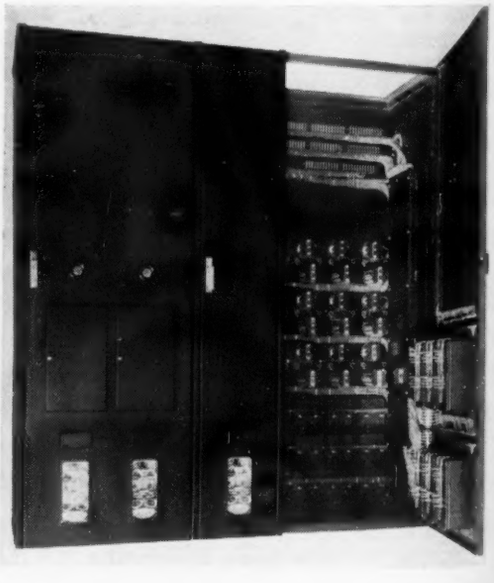
## Speeding Operation of Drives Through Use of Simplified Control System

SWITCHBOARD and distribution panels, until recently were assembled units designed and built up at the point of installation, in many cases by men who had little practical experience in such construction. Instruments, slate or marble, structural work and copper were commonly bought separately and assembled as installed. As a result the back of the board or panel was usually exposed to dust or enclosed in a large housing providing a specified clear space back of the live parts for protection of operators when inspecting or servicing.

By using totally enclosed switchboards and distribution panels made of sheet steel with all wiring carefully insulated, as shown in the two accompanying illustrations, the installation is more compact, and protected against dust and accidental contact with live units, well arranged and easily installed. Such units are designed, constructed, wired and instrumented complete for the particular requirements of each installation by the manufacturer, but are sufficiently standardized to simplify manufacture and application to any problems.

The illustrated 3-unit switchboard, equipped with semiflush instruments, is used with a 15-unit metal-clad switchgear controlling two 1500-kilovolt-ampere, 2300-volt generators and 12 feeders. Left-hand unit, shown in the front view, contains controls and instruments for generators. Center unit carries voltmeters, indicating wattmeters, recording watthour meter and recording voltmeter. Right-hand unit controls 12 feeders each with an ammeter, ammeter transfer switch and oil circuit-breaker control. Right hand unit, shown in rear view, carries watthour meters and test blocks for each generator circuit. Generator regulators are in compartments behind hinged doors above the regular control handles. The





**FRONT view shows Delta - Star 3 - unit totally - enclosed steel switchboard and distribution panels, while rear view shows open door at back of units, giving accessibility to complete wiring and additional indicating and control instruments**

center unit carries a totalizing watthour meter and test block. Left-hand unit carries watthour meters and test blocks for 6 feeder circuits.

To install it is necessary only to connect up the incoming and outgoing circuits at points provided and identified. This is a simple problem compared to wiring up the entire board. This three-unit switchboard was designed and constructed by Delta-Star Electric Co., Chicago.

♦ ♦ ♦

## Build Five Special Drives

Adequate lubrication and special treatment to permit operation with a minimum of wear and thus maintain accuracy in operation are features incorporated in the design and construction of the special forming roll drive shown in an accompanying illustration. This is one of five special drives built to drive five stands of forming rolls of an electric-weld tube mill. Each drive transmits 150 horsepower. Three pairs of Sykes-type, continuous-tooth, herringbone gears provide a speed reduction ratio of slightly over 113 to 1. The pinion unit for connecting the drive to the rolls is built integral with the drive. The pinions have single helical teeth and are of the same size so the rolls run at the same speed.

The teeth of all gears and pinions, except the first reduction, are torch-hardened to minimize wear in operation. The reduction pinions are of forged steel and cut integral on the shafts. Gear and mill pinions are of cast steel. Mill-pinion shafts are of heat-treated, nickel-alloy steel. The gear cases are also of cast steel of heavy section for strength and rigidity. All shafts are mounted in antifriction roller bearings. Gears are lubricated by built-in sprays and the bearings are flood lubricated. Oil is supplied to both bearings and gears by a central lubricating system. The drive is manufactured by Farrel-Birmingham Co., Ansonia, Conn. Comparison with the mechanic indicates size of the drive units.

♦ ♦ ♦

An old machine was so designed that the motor was belted to a double countershaft with a clutch and loose pulleys to obtain either of two speeds. The installation of a variable speed transmission direct-connected to the motor eliminated the clutch, loose pulleys and countershafts with their heavy maintenance costs. The new arrangement also permitted obtaining a wide range of speed adjustments instead of only two speeds.

♦ ♦ ♦

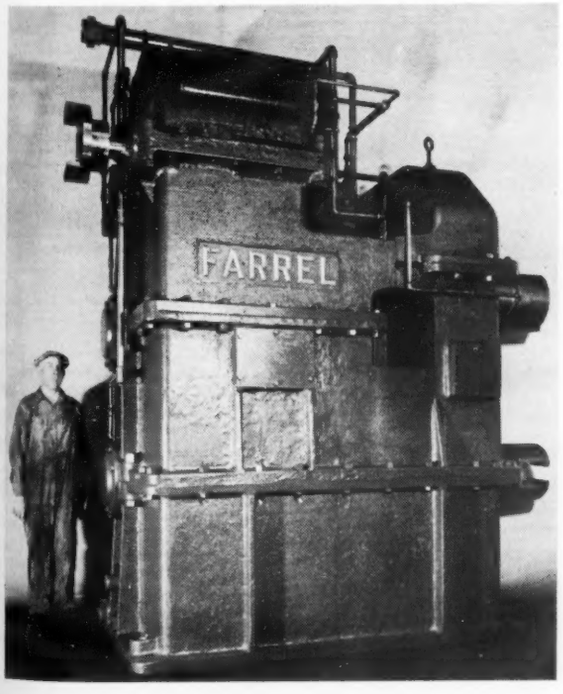
In a plant where interruptions and belt slippage are important because of the effect upon the finish of the product, all belts are inspected every two weeks for tension, belt fasteners, and for accumulation of dirt or oil on the driving surface.

♦ ♦ ♦

Use of V-belts from motor to line-shaft in a wet location permitted obtaining the speed reduction in a single step and the elimination of a jackshaft in the former two-step reduction, together with decreased maintenance and other losses.

♦ ♦ ♦

To prevent division of responsibility the electricians in one plant inspect, service and maintain speed reducers along with the driving motors. This practice prevents over-lubrication of adjacent bearings and the oil creeping back into motor windings. Making one man responsible is a recognition that the entire drive is a unit and should be so considered in design, installation, operation and maintenance.




**ONE of five special drives to forming rolls of electric weld tube mill has gear teeth torch-hardened and flood-lubricated**

## New Motor-Generator Bases

Seeking greater structural strength, absence of warping or misalignment and less risk of breakage, Reliance Electric & Engineering Co., Cleveland, has supplanted cast iron bases for its motor-generator sets with bases made of electrically welded, heavy gage steel, principal features of which are V-shaped reinforcing ribs. The top, sides and base flange are each pressed from a single sheet, while welds that are stress-relieved after completion further tend to prevent the distortion that is undesirable in bases which must support two mechanically-coupled machines. Reduced weight, no delays due to the need for making special patterns for non-standard needs and more uniform structural strength are other items which are advantageous, it is claimed.

**THE welded steel base now used by Reliance Electric & Engineering Co., Cleveland, for motor-generator sets is reinforced by V-shaped ribs**

## Bearings Get Machine Wash

As an aid in servicing motors at the Chicago service shop of Westinghouse Electric & Mfg. Co., a motor-operated washing machine is used in which antifriction type bearings are thoroughy cleaned and all hard grease and dirt removed. Two baskets 10 x 15 inches in size and 5 inches high are suspended from a rocker arm that dips them in a cleaning fluid at a rate of 44 times a minute for periods of at least thirty minutes. Perfectly washed, the bearings are then coated with fresh lubricant and wrapped in oil-proof paper for storage until reassembled in the motor.

# NEW EQUIPMENT

**Broaching Machine—**

American Broach & Machine Co., Ann Arbor, Mich., has designed the American PD, pull down, broaching machine for fast, accurate internal broaching. In this machine the ram, the hydraulic cylinder and its accurately machined slideways are all in one special casting, providing a long stroke with relatively low column-height and bringing the work support to a position most convenient for easy work handling. The weight and mass of the moving ram and cylinder promote smooth, uniform cutting. The hydraulic cylinder has an accurate and finely finished bore closely fitted to its piston, insuring efficient application of power to the broaching, smooth cutting and uniformly rapid return. Slide-ways of the ram-cylinder casting bear upon bars of hardened and ground steel carefully fitted and solidly secured to the rigid frame at the front and on both sides. Similar bars form caps at the rear of the bearing so slide-ways are entirely surrounded by hardened and ground steel throughout their travel. Submerged in oil in a separate compartment of the base, a Sundstrand hydraulic unit supplies uniform oil flow at correct pressures and in suitable volume for the cutting stroke and rapid return. The hydraulic circuit includes an adjustable safety valve, has a minimum of connections and is precisely controlled by a four-way valve. Coolant is pumped directly to the work in process from a large reservoir, in the base of the machine, which is separated from the chip compartment by a series of baffle plates. A standard motor of 5 horsepower drives the machine at 1800 revolutions per minute through multiple V-belts direct to the shaft of the hydraulic unit.

**American Type PD machine is for fast, accurate, internal broaching**

♦ ♦ ♦

**Telescoping High Lift Truck—**

Baker-Raulang Co., Cleveland, has announced a new telescoping high lift truck of 5-ton capacity to be known as the company's type HH-5. New machine permits tiering skids to extreme heights while retaining a nested height low enough to enter a standard box car. With this nested height of 88 inches, the maximum lift of the truck platform is 106 inches above the floor. Platform is 26½ inches wide by 54 inches long and 11 feet high in the lowered position, although these dimensions may be varied to suit requirements within reasonable limits. Hoisting is accomplished by two double, alloy steel roller chains, each having an ultimate strength of 34,000 pounds. Frame is fabricated of SAE, 1045 steel plate, arc welded and hot riveted through drilled holes reamed to size in place during assembly. Upright members are heat treated alloy steel castings in channel form. Trailing axle is of the tandem type which is articulated and fully compensating in both longitudinal and transverse directions. This type of axle, in conjunction with the Baker duplex com-

# OPERATOR INTEREST... INCREASED PRODUCTION

## —go hand and hand with SUNOCO

**OPERATION:**
Precision grinding diameters, 15/16", 5/8" and 3/4" on feed shaft.

**MACHINE:**
Cincinnati 6 x 30 Plain Hydraulic Grinding Machine.

**MATERIAL:**
Chrome nickel steel

**LIMITS:**
Minus .001" on 15/16" diam.
Minus .0015" on 5/8"diam.
Minus .002" on 3/4" diam.

**PRODUCTION:**
10 pieces per hour—three operations on each piece.

**METHOD EMPLOYED:**
Plunge-cut and traverse grinding.

**COOLANT:**
One part SUNOCO to 20 parts water.

***Courtesy of Cincinnati Grinders Inc., Cincinnati, Ohio.***

NEW grinding machines, flexible in operation and designed to maintain closer tolerances — plus operator interest in greater production per work hour — depend on the grinding coolant for efficient production.

SUNOCO is the grinding coolant to assure efficient production consistently. In the grinding operation it has made possible closer limits of accuracy, faster stock removal without increasing wheel wear, and yet has reduced to a minimum the danger of burning the work.

For mirror finishes, greater precision, and increased production per abrasive unit specify the modern grinding fluid developed to meet every grinding requirement—SUNOCO Emulsifying Cutting Oil.

**SUNOCO**
**EMULSIFYING**
**CUTTING OIL**

**SUN OIL COMPANY, PHILADELPHIA, PA., U. S. A.**
*Offices and Warehouses in more than 100 cities*
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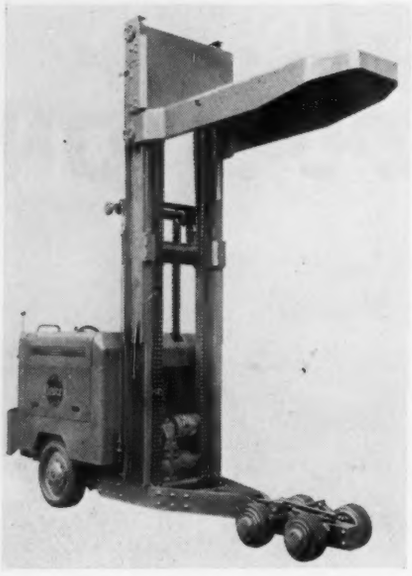


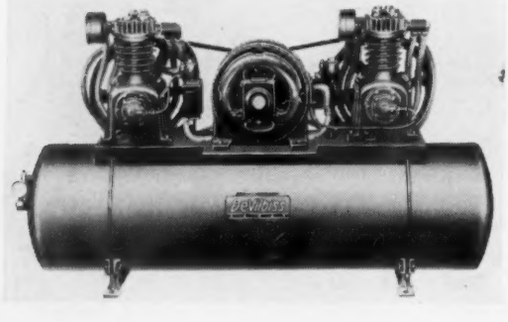
**Baker-Raulang lift truck is of the telescoping type**

pensating suspension of the power axle, is said to permit the truck to travel over rough floors without the transmission of road shocks or twisting strains to the frame and without danger of spilling the load. The hoist controller operates through a magnetic blow-out, mill-type contactor, which takes all the arcing from the controller itself. This controller is connected to the hoisting mechanism in such manner that it is returned automatically to neutral at the upper and lower limits of platform travel.

♦ ♦ ♦

**Air Compressers—**

DeVilbiss Co., Toledo, O., is manufacturing four new air compressing outfits offered in 7½ or 10 horsepower, with single or two-stage compressors available with either horsepower and designed for small industrial plants whose compressed air needs are beyond the capacity of the ordinary air-cooled compressor but not equal to the capacity of the industrial-type, water-cooled air compressing outfit. Two compressors, each developing a maximum pressure of 200 pounds with the two-stage compressors or 150 pounds with the single stage, are firmly mounted on opposite ends of the 20 x 60-inch air tank with motor driving both compressors set between them on the air tank. Each compressor has a V-belt drive, combination air strainer and muffler, check valve, inter and after cooler and centrifugal pressure release mechanism set to cut in at 160 pounds and cut out at 200 pounds on the two-stage, and in at 80 pounds and out at 100 pounds on single stage compressor. Displacement of outfits varies from 31½ to 57 cubic feet of free air a minute, depending on pressure and horsepower. Air tank capacity of both 7½ and 10 horsepower outfits is 10.88 cubic feet, although a 20 x 72-inch tank with an air capacity of 13.06 cubic feet is also available. Standard equipment on all outfits includes pressure gage, outlet, drain and safety valves and automatic starting device.

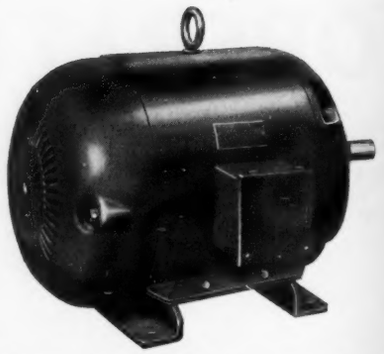


**DeVilbiss air compressing outfit is available in four sizes for small industrial plants**

♦ ♦ ♦

**Fan-Cooled Motor—**

Wagner Electric Corp., Plymouth avenue, St. Louis, has announced its type CP, totally-enclosed, fan-cooled motor for driving equipment in atmospheres heavily laden with abrasive dusts, deteriorating metals and salts, explosive dusts, corrosive gases and extreme dampness on outdoors locations. An external blower is mounted on the front end which directs cooling air around the front endplate, over the corrugated surfaces and through a baffled back endplate down over the bearing. The movement of air over these surfaces is directed by specially designed blower and frame shields. Shaft of the motor is special alloy steel for strength and has machined fillets at all changes of diameter to prevent fatigue. Ball bearings are all of the cartridge type and are of the same diameter on both ends to permit double shaft extensions of the same diameter. No cored holes are used for introducing grease, eliminating contamination of grease by foundry sand, while caps of the cartridges are also specially designed to prevent entrance of water along the shaft. Endplate on the back is of the one-piece deflector type to aid in keeping the bearing



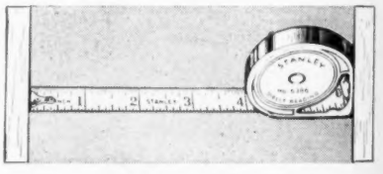
**Wagner type CP is a totally-enclosed, fan-cooled motor**

cool and both endplates are provided with threaded air gap holes. The core of these motors is in the center of the frame to permit reversing of endplates and rotor in order to reverse location of the conduit box.

♦ ♦ ♦

**Shop Rule—**

Stanley Rule & Level Plant, New Britain, Conn., has announced a new Stanley No. 6386 "Pull-Push" rule with a direct reading feature for inside measurements. When the case and blade butt against the work, a red indicator on the case points to the exact inside measurement, eliminatitng necessity to add or chance for mistakes. Flexible-rigid steel blade having a white baked enamel surface against which the black graduations stand out plainly, is ½-inch wide, 6 feet long and graduated in inches and 16ths



**Stanley rule has direct reading feature for inside measurements**

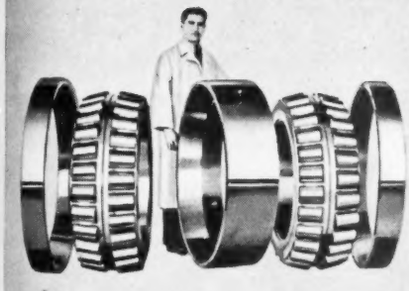
on both edges for the entire length. On upper edge the blade is graduated in 32nds for the first six inches. Watch size, the tool is handy for measuring straight distances, circumferences, irregular shapes and outside as well as inside measurements.

♦ ♦ ♦

**Dial Indicator—**

Chicago Dial Indicator Co., 180 North Wacker drive, Chicago, is marketing a Geneva precision dial indicator designed in accordance with the theory that a lever is the best medium for multiplication as it has but one pivot point between the driver and the driven. A lever arm is used instead of a multiplic-

# THIS JOB DEMANDS BANTAM *Quality*



In the production of large bearings such as this, extra rings are made which get complete laboratory analysis. They must be checked for uniform annealing and grain structure. They are put through gruelling impact tests. In this way we know Bantam Bearings are right before they ever leave the factory.

EXPERIENCE shows that Bantam Bearings are built to last longer. Constant control of production through highly scientific methods assures minute accuracy of every bearing produced, whether it be a 60-inch tapered roller steel mill bearing or a tiny roller weighing 1/1000th of an ounce.

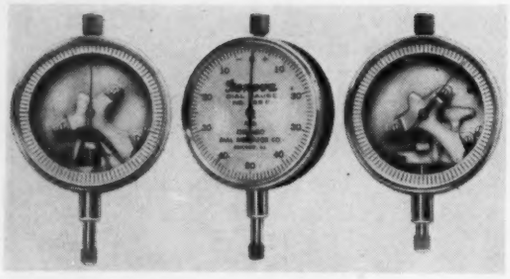
In steel, cement, and paper mills . . . on the famous streamline trains . . . the nation's great engineering projects—in fact any place there is a tough job to be done, you'll find more and more engineers specifying Bantam Bearings.

From the ingot to finished product Bantam Bearings are built to give you complete satisfaction. Use them.

**BANTAM BEARINGS CORPORATION**
SOUTH BEND, INDIANA
Subsidiary of THE TORRINGTON COMPANY
Torrington, Conn.

**BANTAM BEARINGS**

**TAPERED ROLLER • • • STRAIGHT ROLLER • • • BALL BEARINGS**



**Mechanism of the Geneva dial indicator is shown, left, at start of travel and, right, at end**

ity of gears, a feature claimed to reduce error and make this unit the lowest friction indicator. With rustproof working parts in a dustproof case, other features include nonbreakable crystal, special bearings, case and plunger mounting machined from one-piece nickel-silver casting, rotating adjustable dial with positive lock nut and lithographed metal dial in silver background with legible black lettering.

♦ ♦ ♦

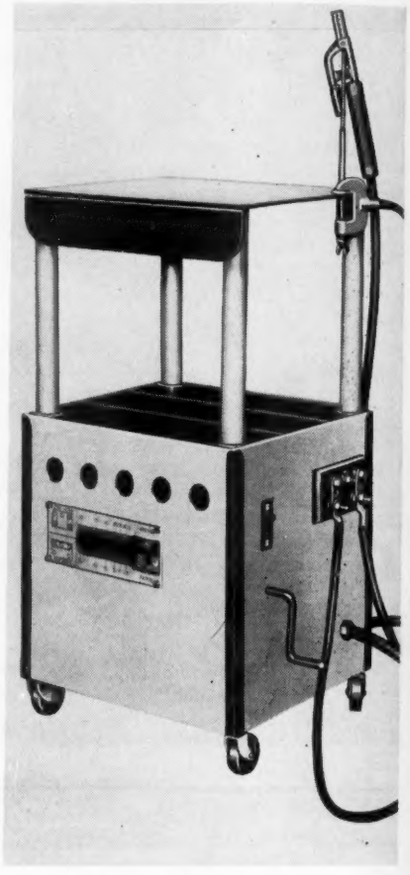
**Cylindrical Grinder—**

Norton Co., Worcester, Mass., has developed an automatic grinding machine for large quantity, economical grinding of cylindrical parts concentric with their axes. Automatic grinding cycle includes placing of the work in the holding and driving position, grinding to accurate size, releasing the finished piece and dropping it into a return chute. Regulation of the time required for the automatic cycle is by a hydraulic valve that may be adjusted at any time during the operation of the machine. The safety factor is notable, since failure of any mechanism to perform its functions results in the stopping of all other mechanisms. The type of headstock, footstock and work loading fixtures used varies according to the shape and size of the work and the grinding requirements. Illustrated is a chute type loading fixture arranged for grinding steel bushings internally splined. A hydraulically operated set of fingers at the bottom of the chute picks off one bushing to be ground and advances it between the centers of the two live spindle synchronized work heads while simultaneously removing the previously ground bushing and dropping it into the return chute. A grinding wheel 24 inches in diameter and up to 5 inches in width, or 20 inches in diameter and up to 7 inches in width, is employed, driven by a constant speed motor of 10 to 25-horsepower, depending on wheel size. Two other motors are used, a ¾ or 1-horsepower constant speed motor for the work drive and a 3-horsepower for the hydraulic lubricating and coolant pumps.

♦ ♦ ♦

**Electric Welder—**

Micro Products Co., 20 North Wacker Drive, Chicago, is introducing a new alternating-current electric welder in three sizes. These include a small 4-kilowatt unit with welding current of 20 to 125 amperes, designed for use in garages and sheet metal, body and fender shops. A medium capacity unit is rated at 7½ kilowatts, with welding current of 50 to 200 amperes, while the largest is a 10-kilowatt welder with current of 75 to 300 amperes. These welders operate on the floating coil principle. Infinite heat changes through the entire range of the unit are made by turning the crank. By changing lugs on the terminal block two open-circuit welding voltages are provided—high voltage for light welding and low voltage for heavy welding.

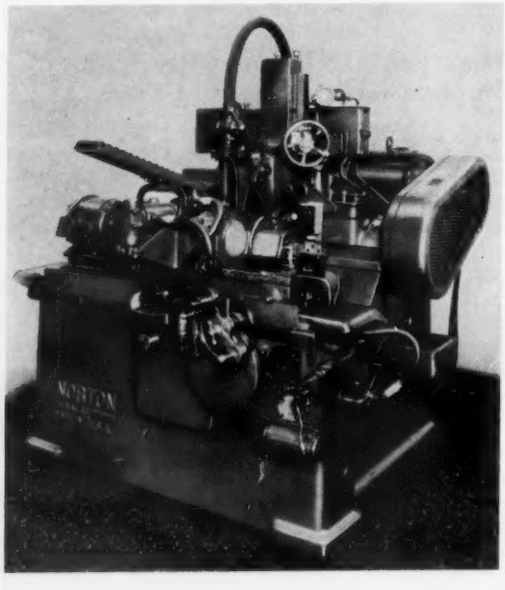


**New Micro welder operates on the floating coil principle**

♦ ♦ ♦

**Kettles—**

Patterson Foundry & Machine Co., East Liverpool, O., has placed on the market a line of motor and belt-driven kettles suitable for use in processing work and built in both plain and stainless steel as well as in aluminum, Monel and other metals. Kettles are supplied with double-motion drives so that the stirrers revolve in opposite directions, and outer stirrer is usually of the scraping type so that the sides of the kettle may be kept perfectly clean and thus promote rapid heat transfer. Machine is powered with the Patterson Horizontal Unipower, providing a compact and rugged source of power and permitting close mounting, particularly desirable in locations where low head room restricts available space for mounting.



**Norton grinder is for automatic grinding of cylindrical parts concentric with their axes**

## Cuts Cost of Handling Auto Plant Forge Flash

(*Concluded from Page* 58)

a load accumulates. Furthermore, the flashings pack and load heavier by chuting in from the overhead bins.

Turnings and borings from machine operations are stored in three covered bins, Fig. 5, similar to those used for storing and loading flashings from the forging department. These bins are for cast iron, nickel steel, and mixed carbon and chrome steels.

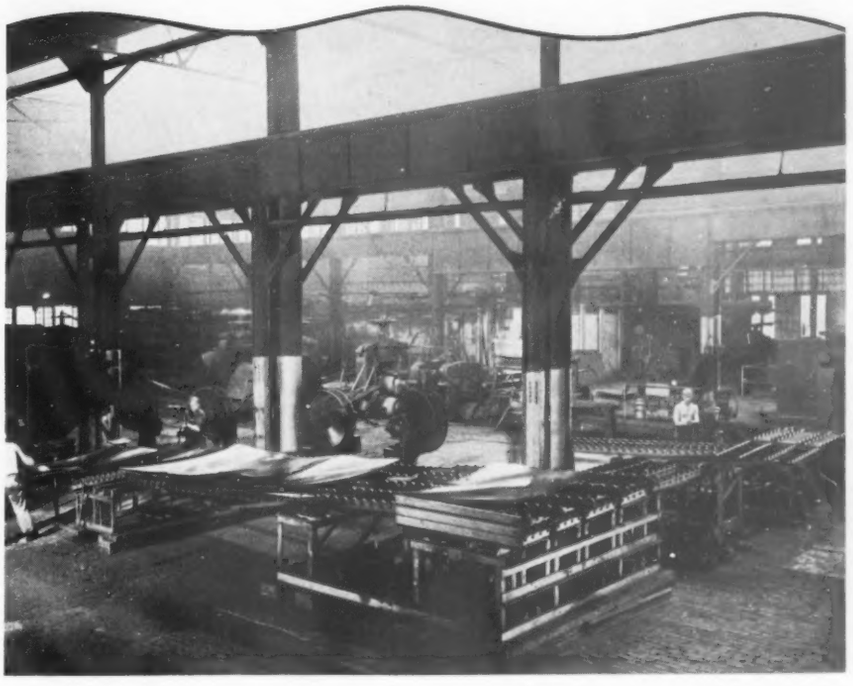
Turnings are collected in large curved-bottom steel pans about 50 inches wide, 59½ inches long and 25¾ inches deep, holding about 4500 pounds of chips, set at convenient points in the shop. Each pan is marked clearly for the type of turnings to be collected in it. These pans are so constructed as to hook at the side on the front of a special electric crane truck. The crane hooks a chain on the other side of the pan, raises it from the floor and carries it to the centrifugal extractors, Fig. 6, in an adjoining building. The truck dumps the pan without unhitching and returns it immediately to its original position in the machining department.

### Chips Crushed and Stored

Steel chips from the extractors are dumped directly into one of the two separate crushers one for nickel steel and the other for carbon and chrome steels located below the floor level. A separate chute is used for cast-iron chips.

Discharge from the crushers is carried directly into the proper storage bins by bucket elevators. Gondolas are loaded on the adjacent siding by dumping or chuting from the bottom of the bins in the same manner as used for loading forging flash. Because the crushed turnings pack better than flashings about 60 tons are loaded in a car. Cars of cast iron and of carbon and chrome steel turnings are loaded about every other day and nickel steel turnings every four days.

Cutting oil extracted from the chips flows into tanks under the floor and from these is pumped into a heater which raises the temperature to 170 degrees Fahr. to kill bacteria. After dirt and moisture are removed by a centrifugal separator, the clean and sterilized oil then goes to storage for reuse.

ALWAYS A STEP AHEAD

STEEL production today tends steadily toward much more finished forms and larger sizes in sheets and strips, and generally speaking, the amount of handling has increased several times faster than has the tonnage.

All of this new handling is, strictly speaking, part of the production process, and has brought the Continuous Flow Principle into the foreground of the industry's thinking.

The Continuous Flow Principle is now seen to be the most important essential in materials handling in order to lower costs, get out the increased volume and finally to meet the demands of buyers for variety and finish in sheets, strips, shapes, rods, pipe and tubes.

But Continuous Flow Production is an old story to Mathews engineers —thirty-two years old. Mathews pioneered the idea of Continuous Flow based upon logical sequence of processes. And because Mathews equipment had such an early start and has kept abreast of industry, it not only includes every type needed, but also anticipates tomorrow's demands.

Processing Equipment installed during 1936-37, embracing the ultimate in design and engineering in the Steel Industry, is illustrated and described in our catalog on Steel Plant Conveyers. Available now.

*The leaders in this industry, responsible for 85% of steel production in the United States and Canada, are applying the Continuous Flow Principle of Handling Materials.*

MATHEWS CONVEYER COMPANY 142 TENTH STREET ELLWOOD CITY, PENNA.

MATHEWS

CONTINUOUS FLOW PRINCIPLE OF HANDLING MATERIALS

CONVEYERS

# RECENT PUBLICATIONS OF MANUFACTURERS

**Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing STEEL, in care of Readers' Service Department, 1213 West Third Street, Cleveland**

**Saws**—Beach Mfg. Co., Montrose, Pa. Bulletin describing the No. 10 and No. 10-A all-steel, welded, engine-driven saws.

**Welding Rods**—American Manganese Steel Co., 389 East 14th street, Chicago Heights, Ill. Bulletin No. 20, covering "AMSCO" hard facing welding rods.

**Metal Lath**—Metal Lath Mfrs. Association, 208 South La Salle street, Chicago. Bulletin "One Hour Plus," No. 3 of a series of informative literature on metal lath and its uses.

**Flasks and Heaters**—Harold E. Trent Co., 618 North 54th street, Philadelphia. Leaflet TE-23, describing electric laboratory flasks, heaters, with table of sizes and ratings.

**Nibblers**—Andrew C. Campbell division American Chain & Cable Co., Bridgeport, Conn. Folder of eight pages entitled "Why Not Nibble It?", dealing with nibblers and production cutting.

**Meters and Controls**—J. L. Vergilio Co., 942 Prospect avenue, Cleveland. Folder illustrating a few examples of the line of meters, controls and recorders handled by the company.

**Rivet Forges**—Johnston Mfg. Co., 2825 East Hennipin avenue, Minneapolis. Bulletin No. 200C, showing a line of oil burning rivet forges and forges for boiler tank and industrial shops.

**Machinery**—Patterson Foundry & Machine Co., East Liverpool, O. Catalog No. 371, large 98 page publication dealing with Patterson machinery for clay and mineral working plants.

**Dehumidifier**—Bryant Heater Co., 17825 St. Clair avenue, Cleveland. Folder and eight advertising forms describing the Bryant Silica-Gel Dehumidifier for drying damp air in industrial locations.

**Caulking Compound**—Truscon Laboratories, Detroit. Folder announcing the new Truscon caulking compound and showing a number of American buildings which have been waterproofed with it.

**Motors**—Century Electric Co., 1806 Pine street, St. Louis, Mo. Form 1032, covering Century slip ring motors of from 1 to 350 horsepower. Form 1033, describing direct-current motors of from 1 to 300 horsepower.

**Hoist**—Myers Engineering Equipment Co., 3947 West Pine boulevard, St. Louis, Mo. Folder dealing with the A.C. "Jack It Up" hoist for lifting into place air conditioning units, fans, motors, heaters, shafting, pulleys.

**Testing Machines**—Baldwin-Southwark Corp., Philadelphia. Large 48 page bulletin containing chart, curves, technical data and comprehensive description of the Southwark-Emery line of testing equipment.

**Sluice Gates**—Koppers Co., Western Gas division, Fort Wayne, Ind. Sluice gate catalog containing detailed drawings, specifications, and dimensions of gates in a wide variety of sizes for seated and unseated pressures.

**Motors**—Reliance Electric Engineering Co., 1088 Ivanhoe road, Cleveland. Bulletin sheet describing the company's method of integrally casting end rings, fans and rotor bars of alternating-current, squirrel-cage, induction motors.

**Dewatering Tanks**—Claude B. Schneible Co., 3951 Lawrence avenue, Chicago. Bulletin covering the new rectangular-type, multi-louver, dewatering tanks for precipitating and dewatering the sludge from Schneible Multi-Wash dust collectors.

**Portable Instruments**—Hays Corp., Michigan City, Ind. Publication No. 37-253, dealing with portable combustion testing instruments such as flue gas analyzers, portable draft gages, flue gas thermometers, combustion test sets and B.t.u. calorimeters.

**Pump and Exhausters**—Roots-Connersville Blower Corp., Connersville, Ind. Bulletin 61-B10, describing and listing the new type RF, 3-lobe, Cycloidal pump and the type SO pump. Bulletin 55-B10, covering the application of certain Roots-Connersville units as exhausters for priming the larger centrifugal pumps.

## Dust Control Is Meeting Subject

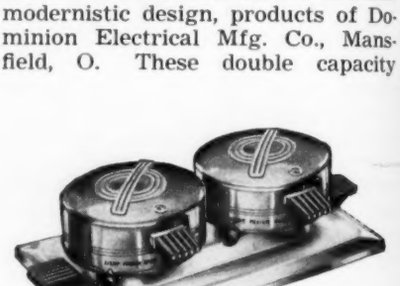
At its June meeting in Cleveland the Dust Control Equipment Association gave careful attention to reports from the engineering committee dealing with work in establishing standards of dust control practice, the need for which had existed for some time. The association endorsed the recommendations of the committee with regard to the adoption of a friction chart and the development of a formula for use in connection with that chart.

Theodore Hatch, associate dust control engineer, department of labor, state of New York, addressed the meeting on the subject "Importance of Modern Standards and Methods of Dust Analysis upon Design and Efficiency of Dust Control Equipment."

Hatch discussed methods used in cleaning dust from the air in South African gold mines and went into detail on the question of the size of dust particles and the relative importance of the different kinds of dusts. He also discussed in detail the various types of equipment available for determining dust count and showed why he considered it unsatisfactory to attempt to establish factors on the basis of a very close determination.

## Steel Kitchen Appliances Handle Double Capacity

Fabricated from No. 3 finish, cold rolled strip steel are a twin waffle iron and a four slice toaster in semi-modernistic design, products of Dominion Electrical Mfg. Co., Mansfield, O. These double capacity

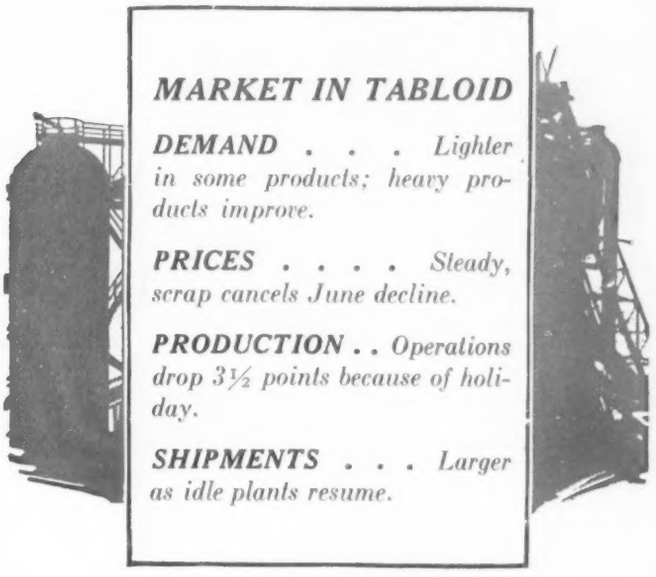


**WAFFLE iron and toaster made of cold rolled strip steel and finished in chrome, products of Dominion Electrical Mfg. Co., Mansfield, O.**

kitchen appliances are made attractive with a chrome-plate finish, while the grids of the waffle iron are of cast aluminum with silver finish. Wood is used only for the decorative walnut handles and for the legs of the waffle iron.

# Continued Buying Cushions Summer Decline

## Scrap Gain Rapid; Auto Output Tapers; Exports Make Record



### MARKET IN TABLOID

***DEMAND*** . . . *Lighter in some products; heavy products improve.*

***PRICES*** . . . . *Steady, scrap cancels June decline.*

***PRODUCTION*** . . *Operations drop 3½ points because of holiday.*

***SHIPMENTS*** . . . *Larger as idle plants resume.*

IN THE face of expected decline in steel buying in the lighter lines steelmakers continue to produce at the best rate circumstances will allow, in the effort to work off tonnages already specified and to reduce the present delay in deliveries.

In spite of such efforts some mills can offer no better than ten to 12 weeks on cold-rolled sheets and some are booked into October on hot-rolled. In other cases four to eight weeks can be obtained.

With this situation, better buying is appearing in other lines, notably in heavy steel, and some early placements of sheets, strip, bars and other steel are being made for 1938 models of automobiles. Railroads have placed substantial orders for rails and rolling stock and a fair volume is pending for this purpose. Structurals are being placed in large tonnages, especially in the west. A leading steelmaker shipped more tonnage in June than in May.

The general expectation is that the fall will bring a renewed volume of buying and that this is likely to appear before present backlogs have been cleared, thus bridging the summer lull and reducing the usual dull period. Some sellers are not booking beyond third quarter, though there is no indication of a rise in prices for later delivery. Some sentiment for an increase of $1 on pig iron has appeared but is not strong.

Observance of the July Fourth holiday and some vacation idleness brought the national operating rate down 3½ points to 74 per cent of capacity for last week as a whole. However, resumption of production by strike-bound plants during the week gave a higher rate at midweek, probably about 78 per cent, and the promise is for a better level this week. Last week Pittsburgh dropped 13 points to 67 per cent, Wheeling 15 points to 77, New England 6 points to 86, Detroit 5 points to 95, Cleveland 2 points to 47 and Eastern Pennsylvania 1 point to 65 per cent. Chicago gained 6½ points to 70 per cent, Youngstown 1 point to 76 and Birmingham 13 points to 96. Buffalo at 87 per cent and Cincinnati and St. Louis, both at 93, showed no change.

Steel ingot production in June was 19 per cent less than in May, because of strike interruption, and only 5 per cent above that of June, 1936. June tonnage was 4,183,762 tons. First half ingot production was less than 1 per cent less than the record first half of 1929. Except for strike effects a new mark would have been set, by a wide margin. First half this year brought 28,764,633 tons, compared with 29,036,274 tons in the corresponding period of 1929, only 271,641 tons short, less than a week's production.

World hunger for steel and iron products and scrap are well illustrated in export figures in May. Finished and semifinished steel exports totaled 405,810 gross tons, which compares with 450,859 tons for the first five months of 1936. Pig iron exports were 117,598 tons and steel ingots and blooms 99,551 tons. Scrap reached an alltime high at 637,679 tons, which is 72 per cent of the total scrap exported in five months of 1936. The accelerating pace of foreign buying is indicated by this comparison.

As an incentive to importers Great Britain has reduced import duties to 2½ per cent on entente quotas of steel from the Continent and to 12½ per cent on shipments in excess of quotas.

Automobile production last week showed the effect of approaching end of the 1937 model season, with total output of 100,981 cars, compared with 122,890 the preceding week. Ford was the only producer holding to the previous rate, with 27,172 compared with 27,210 the previous week. General Motors fell off to 40,091 from 50,490 and Chrysler to 21,050 from 28,775. Output of all other makers dropped to 12,668 from 16,415.

As a result of underlying strength in scrap the composite has reacted sharply, gaining 67 cents, to $17.75. This has wiped out the decline of June and regained the level of the final week of May. The iron and steel composite also reflected the rise in scrap by advancing 8 cents to $39.89. The finished steel composite continued unchanged at $61.70.

# COMPOSITE MARKET AVERAGES

| | July 10 | July 3 | June 26 | One Month Ago June, 1937 | Three Months Ago Apr., 1937 | One Year Ago July, 1936 | Five Years Ago July, 1932 |
|---|---|---|---|---|---|---|---|
| Iron and Steel .... | $39.89 | $39.83 | $39.78 | $39.82 | $40.39 | $33.49 | $28.87 |
| Finished Steel .... | 61.70 | 61.70 | 61.70 | 61.70 | 61.45 | 53.40 | 47.71 |
| Steelworks Scrap.. | 17.75 | 17.08 | 17.00 | 17.15 | 21.67 | 12.89 | 6.06 |

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

# A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

## Finished Material

| | July 10. 1937 | June 1937 | April 1937 | July 1936 |
|---|---|---|---|---|
| Steel bars, Pittsburgh | 2.45c | 2.45c | 2.45c | 1.95c |
| Steel bars, Chicago | 2.50 | 2.50 | 2.50 | 2.00 |
| Steel bars, Philadelphia | 2.74 | 2.74 | 2.74 | 2.26 |
| Iron bars, Terre Haute, Ind. | 2.35 | 2.35 | 2.35 | 1.85 |
| Shapes, Pittsburgh | 2.25 | 2.25 | 2.25 | 1.90 |
| Shapes, Philadelphia | 2.45½ | 2.45½ | 2.45½ | 2.11½ |
| Shapes, Chicago | 2.30 | 2.30 | 2.30 | 1.95 |
| Tank plates, Pittsburgh | 2.25 | 2.25 | 2.25 | 1.90 |
| Tank plates, Philadelphia | 2.43½ | 2.43½ | 2.43½ | 2.09 |
| Tank plates, Chicago | 2.30 | 2.30 | 2.30 | 1.95 |
| Sheets, No. 10, hot rolled, Pitts. | 2.40 | 2.40 | 2.40 | 1.95 |
| Sheets, No. 24, hot ann., Pitts. | 3.15 | 3.15 | 3.15 | 2.50 |
| Sheets, No. 24, galv., Pitts. | 3.80 | 3.80 | 3.80 | 3.20 |
| Sheets, No. 10, hot rolled, Gary | 2.50 | 2.50 | 2.50 | 2.05 |
| Sheets, No. 24, hot anneal., Gary | 3.25 | 3.25 | 3.25 | 2.60 |
| Sheets, No. 24, galvan., Gary | 3.90 | 3.90 | 3.90 | 3.30 |
| Plain wire, Pittsburgh | 2.90 | 2.90 | 2.90 | 2.40 |
| Tin plate, per base box, Pitts. | $5.35 | 5.35 | 5.25 | 5.25 |
| Wire nails, Pittsburgh | 2.75 | 2.75 | 2.75 | 2.10 |

## Semifinished Material

| | | | | |
|---|---|---|---|---|
| Sheet bars, open-hearth, Youngs. | $37.00 | $37.00 | $37.00 | $30.00 |
| Sheet bars, open-hearth, Pitts. | 37.00 | 37.00 | 37.00 | 30.00 |
| Billets, open-hearth, Pittsburgh | 37.00 | 37.00 | 37.00 | 30.00 |
| Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts. | 47.00 | 47.00 | 47.00 | 38.00 |

## Pig Iron

| | July 10. 1937 | June 1937 | April 1937 | July 1936 |
|---|---|---|---|---|
| Bessemer, del. Pittsburgh | $25.26 | $25.26 | $25.26 | $20.81 |
| Basic, Valley | 23.50 | 23.50 | 23.50 | 19.00 |
| Basic, eastern del. East Pa. | 25.26 | 25.26 | 25.26 | 20.81 |
| No. 2 fdy., del. Pittsburgh | 25.21 | 25.21 | 25.21 | 20.31 |
| No. 2 fdy, Chicago | 24.00 | 24.00 | 24.00 | 19.50 |
| Southern No. 2, Birmingham | 20.38 | 20.38 | 20.38 | 15.50 |
| Southern No. 2, del. Cincinnati | 23.69 | 23.69 | 23.69 | 20.2007 |
| No. 2X eastern, del. Phila. | 26.135 | 26.135 | 26.135 | 21.68 |
| Malleable, Valley | 24.00 | 24.00 | 24.00 | 19.50 |
| Malleable, Chicago | 24.00 | 24.00 | 24.00 | 19.50 |
| Lake Sup., charcoal, del. Chicago | 30.04 | 30.04 | 30.04 | 25.2528 |
| Gray forge, del. Pittsburgh | 24.17 | 24.17 | 24.17 | 19.67 |
| Ferromanganese, del. Pittsburgh | 107.29 | 107.29 | 99.79 | 80.13 |

## Scrap

| | | | | |
|---|---|---|---|---|
| Heavy melting steel, Pittsburgh | $19.25 | $18.40 | $22.75 | $14.15 |
| Heavy melt. steel, No. 2, East Pa. | 16.25 | 15.25 | 19.06 | 11.50 |
| Heavy melting steel, Chicago | 16.25 | 16.00 | 20.75 | 13.25 |
| Rail for rolling, Chicago | 19.25 | 19.50 | 23.35 | 14.00 |
| Railroad steel specialties, Chicago | 18.75 | 19.50 | 23.75 | 14.75 |

## Coke

| | | | | |
|---|---|---|---|---|
| Connellsville, furnace, ovens | $4.50 | $4.65 | $4.50 | $3.45 |
| Connellsville, foundry, ovens | 5.30 | 5.30 | 5.05 | 4.25 |
| Chicago, by-product foundry, del. | 11.00 | 11.00 | 11.00 | 9.75 |

# Steel, Iron, Raw Material, Fuel and Metals Prices

*Except when otherwise designated, prices are base, f.o.b. cars.*

## Sheet Steel

**Prices Subject to Quantity Extras and Deductions (Except Galvanized)**

**Hot Rolled No. 10, 24-48 in.**

| | |
|---|---|
| Pittsburgh | 2.40c |
| Gary | 2.50c |
| Chicago, delivered | 2.53c |
| Detroit, del. | 2.60c |
| New York, del. | 2.73c |
| Philadelphia, del. | 2.69c |
| Birmingham | 2.55c |
| St. Louis, del. | 2.63c |
| Granite City, Ill. | 2.60c |
| Pacific ports, f.o.b. dock | 2.95c |

**Hot Rolled Annealed No. 24**

| | |
|---|---|
| Pittsburgh | 3.15c |
| Gary | 3.25c |
| Chicago, delivered | 3.28c |
| Detroit, delivered | 3.35c |
| New York, del. | 3.48c |
| Philadelphia, del. | 3.44c |
| Birmingham | 3.30c |
| St. Louis, del. | 3.38c |
| Granite City, Ill. | 3.35c |
| Pacific ports, f.o.b. dock | 3.80c |

**Galvanized No. 24**

| | |
|---|---|
| Pittsburgh | 3.80c |
| Gary | 3.90c |
| Chicago, delivered | 3.93c |
| Philadelphia, del. | 4.09c |
| New York, delivered | 4.13c |
| Birmingham | 3.95c |
| St. Louis, del. | 4.03c |
| Granite City, Ill. | 4.00c |
| Pacific ports, f.o.b. dock | 4.40c |

**Tin Mill Black No. 28**

| | |
|---|---|
| Pittsburgh | 3.30c |
| Gary | 3.40c |
| St. Louis, delivered | 3.53c |
| Granite City, Ill. | 3.50c |

**Cold Rolled No. 10**

| | |
|---|---|
| Pittsburgh | 3.10c |
| Gary | 3.20c |
| Detroit, delivered | 3.30c |
| Philadelphia, del. | 3.39c |
| New York, del. | 3.43c |
| St. Louis, del. | 3.33c |
| Granite City, Ill. | 3.30c |
| Pacific ports, f.o.b. dock | 3.70c |

**Cold Rolled No. 20**

| | |
|---|---|
| Pittsburgh | 3.55c |
| Gary | 3.65c |
| Detroit, delivered | 3.75c |
| Philadelphia, del. | 3.84c |
| New York, del. | 3.88c |
| St. Louis | 3.78c |
| Granite City, Ill. | 3.75c |

**Enameling Sheets**

| | |
|---|---|
| Pittsburgh, No. 10 | 2.90c |
| Pittsburgh, No. 20 | 3.50c |
| Gary, No. 10 | 3.00c |
| Gary, No. 20 | 3.60c |
| St. Louis, No. 10 | 3.13c |
| St. Louis, No. 20 | 3.73c |

## Tin and Terne Plate

Gary base, 10 cents higher.

| | |
|---|---|
| Tin plate, coke, (base box), Pittsburgh | $5.35 |
| Waste-waste, 2.75c; strip | 2.50c |
| Long ternes, No. 24, unassorted, Pitts. | 4.10c |

## Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

**Chrome-Nickel**

| | No. 302 | No. 304 |
|---|---|---|
| Bars | 24.00 | 25.00 |
| Plates | 27.00 | 29.00 |
| Sheets | 34.00 | 36.00 |
| Hot strip | 21.50 | 23.50 |
| Cold strip | 28.00 | 30.00 |

**Straight Chromes**

| | No. 410 | No. 430 | No. 442 | No. 446 |
|---|---|---|---|---|
| Bars | 18.50 | 19.00 | 22.50 | 27.50 |
| Plates | 21.50 | 22.00 | 25.50 | 30.50 |
| Sheets | 26.50 | 29.00 | 32.50 | 36.50 |
| Hot strip | 17.00 | 17.50 | 23.00 | 28.00 |
| Cold stp. | 22.00 | 22.50 | 28.50 | 36.50 |

## Steel Plate

| | |
|---|---|
| Pittsburgh | 2.25c |
| New York, del. | 2.53c |
| Philadelphia, del. | 2.43½c |
| Boston, delivered | 2.65c |
| Buffalo, delivered | 2.50c |
| Chicago or Gary | 2.30c |
| Cleveland, del. | 2.44½c |
| Birmingham | 2.40c |
| Coatesville, base | 2.35c |
| Sparrows Pt., base | 2.35c |
| Pacific ports, f.o.b. cars, dock | 2.80c |
| St. Louis, delivered | 2.52c |

## Structural Shapes

| | |
|---|---|
| Pittsburgh | 2.25c |
| Philadelphia, del. | 2.45½c |
| New York, del. | 2.50¼c |
| Boston, delivered | 2.63½c |
| Bethlehem | 2.35c |
| Chicago Chicago | 2.30c |
| Cleveland, del. | 2.45c |
| Buffalo | 2.35c |
| Gulf Ports | 2.65c |
| Birmingham | 2.40c |
| Pacific ports, f.o.b. cars, dock | 2.80c |
| St. Louis, del. | 2.52c |

## Bars

**Soft Steel**

(Base, 3 to 25 tons)

| | |
|---|---|
| Pittsburgh | 2.45c |
| Chicago or Gary | 2.50c |
| Duluth | 2.60c |
| Birmingham | 2.60c |
| Cleveland | 2.50c |
| Buffalo | 2.55c |
| Detroit, delivered | 2.60c |
| Pacific ports, f.o.b. cars, dock | 3.00c |
| Philadelphia, del. | 2.74c |
| Boston, delivered | 2,85c |
| New York, del. | 2.78c |
| Pitts., forg. qual. | 2.80c |

**Rail Steel**

To Manufacturing Trade

| | |
|---|---|
| Pittsburgh | 2.30c |
| Chicago or Gary | 2.35c |
| Moline, Ill. | 2.35c |
| Cleveland | 2.35c |
| Buffalo | 2.40c |

**Iron**

| | |
|---|---|
| Terre Haute, Ind. | 2.35c |
| Chicago | 2.40c |
| Philadelphia | 2.64c |
| Pittsburgh, refined | 3.50-8.00c |

**Reinforcing**

New billet, straight lengths, quoted by distributors

| | |
|---|---|
| Pittsburgh | 2.55c |
| Chicago, Gary, Buffalo, Cleve., Birm., Young. | 2.60c |
| Gulf ports | 2.65c |
| Pacific coast ports, f.o.b. car docks | 2.95c |
| Philadelphia, del. | 2.84c |

Rail steel, straight lengths, quoted by distributors

| | |
|---|---|
| Pittsburgh | 2.40c |
| Chicago, Buffalo, Cleveland, Birm., Young. | 2.45c |
| Gulf ports | 2.80c |

## Wire Products

Prices apply to straight or mixed carloads; less carloads $5 higher; less carloads fencing $5 over base column.

Base Pitts.-Cleve. 100 lb. keg.

| | |
|---|---|
| Standard wire nails | $2.75 |
| Cement coated nails | $2.75 |

(Per pound)

| | |
|---|---|
| Polished staples | 3.45c |
| Galv. fence staples | 3.70c |
| Barbed wire, galv. | 3.40c |
| Annealed fence wire | 3.20c |
| Galv. fence wire | 3.60c |
| Woven wire fencing (base column, c. l.) | $74.00 |
| Single loop bale ties, (base column, c. l.) | 63.00 |

**To Manufacturing Trade**

| | |
|---|---|
| Plain wire, 6-9 ga. | 2.90c |

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.

| | |
|---|---|
| Spring wire, Pitts. or Cleveland | 3.50c |

Do., Chicago up $1, Worc. $2.

## Cold-Finished Carbon Bars and Shafting

| | |
|---|---|
| Pittsburgh | 2.90c |
| Chicago | 2.95c |
| Gary, Ind. | 2.95c |
| Detroit | 2.95c |
| Cleveland | 2.95c |
| Buffalo | 3.00c |

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

## Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

| | |
|---|---|
| Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem | 3.00c |

| S.A.E. | Alloy Diff. | S.A.E. | Alloy Diff. |
|---|---|---|---|
| 2000 | 0.35 | 3100 | 0.70 |
| 2100 | 0.75 | 3200 | 1.35 |
| 2300 | 1.55 | 3300 | 3.80 |
| 2500 | 2.25 | 3400 | 3.20 |

| | |
|---|---|
| 4100 0.15 to 0.25 Mo. | 0.55 |
| 4600 0.20 to 0.30 Mo. 1.50-2.00 Ni. | 1.10 |
| 5100 0.80-1.10 Cr. | 0.45 |
| 5100 Cr. spring | 0.15 |
| 6100 bars | 1.20 |
| 6100 spring | 0.85 |
| Cr. N., Van | 1.50 |
| Carbon Van. | 0.85 |
| 9200 spring flats | 0.15 |
| 9200 spring rounds, squares | 0.40 |

## Piling

| | |
|---|---|
| Pittsburgh | 2.60c |
| Chicago, Buffalo | 2.70c |

## Strip and Hoops

(Base, hot rolled, 25-1ton)
(Base, cold-rolled, 25-3 tons)

| | |
|---|---|
| Hot strip to 23/4-in. Pittsburgh | 2.40c |
| Chicago or Gary | 2.50c |
| Birmingham base | 2.55c |
| Detroit, del. | 2.60c |
| Philadelphia, del. | 2.69c |
| New York, del. | 2.73c |
| Cooperage hoop, Pittsburgh | 2.50c |
| Chicago | 2.60c |

Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland 3.20c
Detroit, del. 3.40c
Worcester, Mass. 3.40c

| Carbon | Cleve. Pitts. | Worcester, Mass. |
|---|---|---|
| 0.26—0.50 | 3.20c | 3.40c |
| 0.51—0.75 | 4.45c | 4.65c |
| 0.76—1.00 | 6.30c | 6.50c |
| Over 1.00 | 8.50c | 8.70c |

## Rails, Track Material

(Gross Tons)

| | |
|---|---|
| Standard rails, mill | $42.50 |
| Relay rails, Pittsburgh, 20—100 lbs. | 32.50-35.50 |
| Light rails, billet qual., Pittsburgh, Chicago | $43.00 |
| Do., rerolling quality | 42.00 |
| Angle bars, billet, Gary, Pittsburgh, So. Chicago | 2.80c |
| Do., axle steel | 3.35c |
| Spikes, R. R. base | 3.15c |
| Track bolts, base | 4.35c |
| Tie plates, base | $46.00 |

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

## Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

**Carriage and Machine**

| | |
|---|---|
| ½ x 6 and smaller | 65-5 off |
| Do. larger | 60-10 off |
| Tire bolts | 50 off |

**Plow Bolts**

| | |
|---|---|
| All sizes | 65-5 off |

**Stove Bolts**

In packages with nuts attached 72½ off; in packages with nuts separate 72½-5 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

| | |
|---|---|
| Step bolts | 60 off |
| Elevator bolts | 50-10-5 off |

**Nuts**

| | |
|---|---|
| S. A. E. semifinished hex.: ½ to 7/8-inch | 60-10 off |
| Do., ½ to 1-inch | 60-5 off |
| Do., over 1-inch | 60 off |

**Hexagon Cap Screws**

| | |
|---|---|
| Milled | 50-10 off |
| Upset, 1-in., smaller | 60 off |

**Square Head Set Screws**

| | |
|---|---|
| Upset, 1-in., smaller | 75 off |
| Headless set screws | 75 off |

## Rivets, Wrought Washers

| | |
|---|---|
| Structural, Pittsburgh, Cleveland | 3.60c |
| Structural, Chicago | 3.70c |
| 7/8-inch and smaller, Pitts., Chi., Cleve. | 65-5 off |
| Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. | $5.75 off |

## Cut Nails

| | |
|---|---|
| Cut nails, C. L., Pitts. (10% disc. on all extras) | $3.60 |
| Do., less carloads, 5 kegs or more, no discount on any extras | $3.90 |
| Do., under 5 kegs no disc. on any extras | $4.05 |

## Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

**Butt Weld**

Steel

| In. | Blk. | Galv. |
|---|---|---|
| ⅛ | 59½ | 49 |
| ¼ | 62½ | 53 |
| 1—3 | 64½ | 55½ |

Iron

| | | |
|---|---|---|
| ¼ | 26 | 8 |
| 1—1¼ | 30 | 14 |
| 1½ | 34 | 16½ |
| 2 | 33½ | 16 |

**Lap Weld**

Steel

| | | |
|---|---|---|
| 2 | 57 | 47½ |
| 2½—3 | 60 | 50½ |
| 3½—6 | 62 | 52½ |
| 7 and 8 | 61 | 50½ |
| 9 and 10 | 60½ | 50 |

Iron

| | | |
|---|---|---|
| 2 | 26½ | 10 |
| 2½—3½ | 27½ | 12½ |
| 4 | 29½ | 16 |
| 4½—8 | 28½ | 15 |
| 9–12 | 24½ | 10 |

**Line Pipe**

Steel

| | |
|---|---|
| 1 to 3, butt weld | 63½ |
| 2, lap weld | 56 |
| 2½ to 3, lap weld | 59 |
| 3½ to 6, lap weld | 61 |
| 7 and 8, lap weld | 60 |
| 10-inch, lap weld | 59½ |
| 12-inch, lap weld | 58½ |

**Butt Weld**

Iron

| | Blk. | Galv. |
|---|---|---|
| ¼ | 25 | 7 |
| 1 and 1¼ | 29 | 13 |
| 1½ | 33 | 15½ |
| 2 | 32½ | 15 |

**Lap Weld**

| | | |
|---|---|---|
| 1½ | 23½ | 7 |
| 2 | 25½ | 9 |
| 2½ to 3½ | 26½ | 11½ |
| 4 | 28½ | 15 |
| 4½ to 8 | 27½ | 14 |
| 9 to 12 | 23½ | 9 |

## Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

**Lap Weld**

| Sizes | Steel | Charcoal Iron |
|---|---|---|
| 1½" OD x 13 Ga. | $10.45 | $23.71 |
| 1¾" OD x 13 Ga. | 11.89 | 22.93 |
| 2" OD x 13 Ga. | 13.31 | 19.35 |
| 2" OD x 11 Ga. | 15.49 | 23.36 |
| 2¼" OD x 13 Ga. | 14.82 | 21.68 |
| 2¼" OD x 11 Ga. | 17.38 | 26.02 |
| 2½" OD x 12 Ga. | 17.82 | 26.57 |
| 2¾" OD x 12 Ga. | 18.86 | 29.00 |
| 3" OD x 12 Ga. | 19.73 | 31.36 |
| 3½" OD x 11 Ga. | 24.89 | 39.81 |
| 4" OD x 10 Ga. | 30.81 | 49.90 |
| 5" OD x 9 Ga. | 47.57 | 73.93 |
| 6" OD x 7 Ga. | 73.25 | ..... |

**Seamless**

| | Hot Rolled | Cold Drawn |
|---|---|---|
| 1" OD x 13 Ga. | $ 8.41 | $ 9.46 |
| 1¼" OD x 13 Ga. | 9.96 | 11.21 |
| 1½" OD x 13 Ga. | 11.00 | 12.38 |
| 1¾" OD x 13 Ga. | 12.51 | 14.09 |
| 2" OD x 13 Ga. | 14.02 | 15.78 |
| 2¼" OD x 13 Ga. | 15.63 | 17.60 |
| 2¼" OD x 12 Ga. | 17.21 | 19.37 |
| 2½" OD x 12 Ga. | 18.85 | 21.22 |
| 2¾" OD x 12 Ga. | 19.98 | 22.49 |
| 3" OD x 12 Ga. | 20.97 | 23.60 |
| 4½" OD x 10 Ga. | 40.15 | 45.19 |
| 3½" OD x 11 Ga. | 26.47 | 29.79 |
| 4" OD x 10 Ga. | 32.85 | 36.96 |
| 5" OD x 9 Ga. | 50.38 | 56.71 |
| 6" OD x 7 Ga. | 77.35 | 87.07 |

## Cast Iron Water Pipe

*Class B Pipe—Per Net Ton*

| | |
|---|---|
| 6-in. & over, Birm. | $46.00-47.00 |
| 4-in., Birmingham | 49.00-50.00 |
| 4-in., Chicago | 57.00-58.00 |
| 6 to 24-in., Chicago | 54.00-55.00 |
| 6-in. & over, east fdy. | 50.00 |
| Do., 4-in. | 53.00 |

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

## Semifinished Steel

**Billets and Blooms**

4 x 4-*inch base; gross ton*

| | |
|---|---|
| Pitts., Chi., Cleve., Buffalo and Young. | $37.00 |
| Philadelphia | 42.30 |
| Duluth | 39.00 |

**Forging Billets**

6 x 6 *to* 9 x 9-*in., base*

| | |
|---|---|
| Pitts., Chicago, Buffalo | 43.00 |
| Forging, Duluth | 45.00 |

**Sheet Bars**

| | |
|---|---|
| Pitts., Cleve., Young., Sparrows Point | 37.00 |

**Slabs**

| | |
|---|---|
| Pitts., Chicago, Cleveland, Youngstown | 37.00 |

**Wire Rods**

| | |
|---|---|
| Pitts., Cleve., No. 5 to 5/16-inch incl. | 47.00 |
| Do., over 5/16 to 41/64-inch incl. | 52.00 |

Chicago up $1; Worcester up $2.

**Skelp**

| | |
|---|---|
| Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt. | 2.10c |

## Coke

*Price Per Net Ton*

**Beehive Ovens**

| | |
|---|---|
| Connellsville, fur. | $4.40- 4.60 |
| Connellsville, fdry. | 5.25- 5.50 |
| Connell. prem. fdry. | 6.00- 6.50 |
| New River fdry. | 6.50- 6.75 |
| Wise county fdry. | 5.75- 6.00 |
| Wise county fur. | 4.75- 5.00 |

**By-Product Foundry**

| | |
|---|---|
| Newark, N. J., del. | 10.85-11.30 |
| Chi., ov., outside del. | 10.25 |
| Chicago, del. | 11.00 |
| Milwaukee, ovens | 11.00 |
| New England, del. | 12.50 |
| St. Louis, del. | 11.00-11.50 |
| Birmingham, ovens | 7.25 |
| Indianapolis, del. | 10.50 |
| Cincinnati, del. | 10.50 |
| Cleveland, del. | 11.00 |
| Buffalo, del. | 10.50 |
| Detroit, del. | 11.10 |
| Philadelphia, del. | 10.60 |

## Coke By-Products

Spot, gal. Producers' Plants

| | |
|---|---|
| Pure and 90% benzol | 16.00c |
| Toluol | 30.00c |
| Solvent naphtha | 30.00c |
| Industrial xylol | 30.00c |

Per lb. f.o.b. Frankford and St. Louis

| | |
|---|---|
| Phenol (200 lb. drums) | 14.75c |
| do. (450 lbs.) | 14.00c |

Eastern Plants, per lb.

| | |
|---|---|
| Naphthalene flakes and balls, in bbls. to jobbers | 7.25c |

Per ton, bulk, f.o.b. oven or port

| | |
|---|---|
| Sulphate of ammonia | $28.50 |

## Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

**Basing Points:**

| | No. 2 Fdry. | Malleable | Basic | Bessemer |
|---|---|---|---|---|
| Bethlehem, Pa. | $25.00 | $25.50 | $23.50 | $26.00 |
| Birdsboro, Pa. | 25.00 | 25.50 | 24.50 | 26.00 |
| Birmingham, Ala.‡ | 20.38 | ..... | 19.38 | 24.50 |
| Buffalo | 24.00 | 24.50 | 23.00 | 25.00 |
| Chicago | 24.00 | 24.00 | 23.50 | 24.50 |
| Cleveland | 24.00 | 24.00 | 23.50 | 24.50 |
| Detroit | 24.00 | 24.00 | 23.50 | 24.50 |
| Duluth | 24.50 | 24.50 | ..... | 25.00 |
| Erie, Pa. | 24.00 | 24.50 | 23.50 | 25.00 |
| Everett, Mass. | 25.75 | 26.25 | 25.25 | 26.75 |
| Hamilton, O. | 24.00 | 24.00 | 23.50 | ..... |
| Neville Island, Pa. | 24.00 | 24.00 | 23.50 | 24.50 |
| Provo, Utah | 22.00 | ..... | ..... | ..... |
| Sharpsville, Pa. | 24.00 | 24.00 | 23.50 | 24.50 |
| Sparrows Point, Md. | 25.00 | ..... | 24.50 | ..... |
| Swedeland, Pa. | 25.00 | 25.50 | 24.50 | 26.00 |
| Toledo, O. | 24.00 | 24.00 | 23.50 | 24.50 |
| Youngstown, O. | 24.00 | 24.00 | 23.50 | 24.50 |

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

**Delivered from Basing Points:**

| | | | | |
|---|---|---|---|---|
| Akron, O., from Cleveland | 25.26 | 25.26 | 24.76 | 25.76 |
| Baltimore from Birmingham | 25.58 | ..... | 24.46 | ..... |
| Boston from Birmingham | 26.37 | ..... | 25.87 | ..... |
| Boston from Everett, Mass. | 26.25 | 26.75 | 25.75 | 27.25 |
| Boston from Buffalo | 26.25 | 26.75 | 25.75 | 27.25 |
| Brooklyn, N. Y., from Bethlehem | 27.27 | 27.77 | ..... | ..... |
| Brooklyn, N. Y., from Bmghm. | 27.05 | ..... | ..... | ..... |
| Canton, O., from Cleveland | 25.26 | 25.26 | 25.76 | 25.76 |
| Chicago from Birmingham | 24.22 | ..... | 24.10 | ..... |
| Cincinnati from Hamilton, O. | 24.07 | 25.01 | 24.51 | ..... |
| Cincinnati from Birmingham | 23.69 | ..... | 22.69 | ..... |
| Cleveland from Birmingham | 24.12 | ..... | 23.62 | ..... |
| Mansfield, O., from Toledo, O. | 25.76 | 25.76 | 25.26 | 25.26 |
| Milwaukee from Chicago | 25.00 | 25.00 | 24.50 | 25.00 |
| Muskegon, Mich., from Chicago, Toledo or Detroit | 26.90 | 26.90 | 26.40 | 27.40 |
| Newark, N. J., from Birmingham | 26.01 | ..... | ..... | ..... |
| Newark, N. J., from Bethlehem | 26.39 | 26.89 | ..... | ..... |
| Philadelphia from Birmingham | 25.38 | ..... | 25.26 | ..... |
| Philadelphia from Swedeland, Pa. | 25.76 | 26.26 | 25.26 | ..... |
| Pittsburgh district from Neville Island | Neville, base plus 63c, 76c, and $1.13 switch'g charges | | | |
| Saginaw, Mich., from Detroit | 26.25 | 26.25 | 25.75 | 25.75 |
| St. Louis, northern | 24.50 | 24.50 | 24.00 | ..... |
| St. Louis from Birmingham | †24.12 | ..... | 23.82 | ..... |
| St. Paul from Duluth | 25.94 | 25.94 | ..... | 26.44 |

†Over 0.70 phos.

**Low Phos.**

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phila. base, standard and copper bearing, $29.63.

| Gray Forge | | Charcoal | |
|---|---|---|---|
| Valley furnace | $23.50 | Lake Superior fur. | $27.00 |
| Pitts. dist. fur. | 23.50 | do., del. Chicago | 30.04 |
| | | Lyles, Tenn. | 26.50 |

**Silvery†**

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

**Bessemer Ferrosilicon†**

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

## Refractories

*Per 1000 f.o.b. Works*

**Fire Clay Brick**

*Super Quality*

Pa., Mo., Ky. ..... $64.60

*First Quality*

Pa., Ill., Md., Mo., Ky. ..... 51.30
Alabama, Georgia ..... 51.30

*Second Quality*

Pa., Ill., Ky., Md., Mo. ..... 46.55
Georgia, Alabama ..... 41.80

*Ohio*

First quality ..... 43.70
Intermediate ..... 39.90
Second quality ..... 35.15

**Malleable Bung Brick**

All bases ..... $59.85

**Silica Brick**

Pennsylvania ..... $51.30
Joliet, E. Chicago ..... 59.85
Birmingham, Ala. ..... 51.30

**Ladle Brick**

(Pa., O., W. Va., Mo.)

Dry press ..... $30.00
Wire cut ..... $28.00

**Magnesite**

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) ..... $45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) ..... 43.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk) ..... 25.00

**Base Brick**

*Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.*

Chrome brick ..... $49.00
Chem. bonded chrome ..... 49.00
Magnesite brick ..... 69.00
Chem. bonded magnesite ..... 59.00

## Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton ..... $23.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail ..... $19.00
Do., for barge ..... $20.00

## Ferroalloys

*Dollars, except Ferrochrome*

Ferromanganese, 78-82%, tidewater, duty pd. ..... $102.50
Do., Baltimore, base ..... 102.50
Do., del. Pittsburgh ..... 107.29
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot ..... 33.00
Do., New Orleans ..... 33.00
Do., 26-28%, Palmerton ..... 39.00
Ferrosilicon, 50% freight allowed, c.l. ..... 69.50
Do., less carload ..... 77.00
Do., 75 per cent ..... 126-130.00
Spot, $5 a ton higher.
Silicoman., 2½ carbon ..... 106.50
2% carbon 111.50; 1%, 121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del. ..... 10.50
Ferrotungsten, stand., lb. con. del. cars ..... 1.80-1.85
Ferrovanadium, 35 to 40% lb., cont. ..... 2.70-2.90
Ferrotitanium, c. l., prod. plant, frt. all., net ton 142.50
Spot, carlots ..... 145.00
Spot, ton lots ..... 150.00
Ferrophosphorous, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage ..... 63.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage 80.00
Ferromolybdenum, stand. 55-65%, lb. ..... 0.95
Molybdate, lb. cont. ..... 0.80
‡Carloads. Quan. diff. apply

## Nonferrous

### METAL PRICES OF THE WEEK

*Spot unless otherwise specified. Cents per pound*

| | Copper: Electro, del. Conn. | Copper: Lake, del. Midwest | Copper: Casting, refinery | Straits Tin, New York: Spot | Straits Tin, New York: Futures | Lead N. Y. | Lead East St. L. | Zinc St. L. | Aluminum 99% | Antimony American Spot, N. Y. | Nickel Cathodes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| July 3 | 14.00 | 14.12½ | 13.75 | 57.37½ | 56.65 | 6.00 | 5.85 | 6.75 | 20.00 | 14.12½ | 35.00 |
| July 5 | Holiday. | | | | | | | | | | |
| July 6 | 14.00 | 14.12½ | 13.75 | 59.25 | 58.50 | 6.00 | 5.85 | 6.75 | 20.00 | 14.12½ | 35.00 |
| July 7 | 14.00 | 14.12½ | 13.75 | 59.75 | 59.00 | 6.00 | 5.85 | 6.75 | 20.00 | 14.12½ | 35.00 |
| July 8 | 14.00 | 14.12½ | 13.75 | 59.62½ | 58.37½ | 6.00 | 5.85 | 6.75 | 20.00 | 14.12½ | 35.00 |
| July 9 | 14.00 | 14.12½ | 13.75 | 59.25 | 58.37½ | 6.00 | 5.85 | 6.75 | 20.00 | 14.12½ | 35.00 |

**MILL PRODUCTS**

*F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 14.00c Conn. copper*

**Sheets**

Yellow brass (high) ..... 19.75
Copper, hot rolled ..... 21.87½
Lead, cut to jobbers ..... 9.50
*Zinc, 100-lb. base ..... 12.00-13.00

**Tubes**

High yellow brass ..... 22.50
Seamless copper ..... 22.62½

**Rods**

High yellow brass ..... 16.25
Copper, hot rolled ..... 18.62½

**Anodes**

Copper, untrimmed ..... 19.12½

**Wire**

Yellow brass (high) ..... 20.00

**OLD METALS**

*Nom. Deal, buying prices*

**No. 1 Composition Red Brass**

*New York ..... 8.75- 9.00
*Cleveland ..... 9.25-9.50
*Chicago ..... 9.25-9.50
*St. Louis ..... 8.75-9.00

**Heavy Copper and Wire**

*New York, No. 1 ..... 11.00-11.25
*Cleveland, No. 1 ..... 11.00-11.25
*Chicago, No. 1 ..... 10.75-11.00
*St. Louis, No. 1 ..... 10.75-11.00

**Composition Brass Borings**

New York ..... 8.00-8.25

**Light Copper**

*New York ..... 9.25-9.50
*Cleveland ..... 9.00-9.25
*Chicago ..... 9.25-9.50
*St. Louis ..... 9.25-9.50

**Light Brass**

*Cleveland ..... 5.25-5.50
*Chicago ..... 5.75-6.00
*St. Louis ..... 5.75-6.00

**Lead**

*New York ..... 5.00
Cleveland ..... 4.50-4.75
*Chicago ..... 5.00-5.12½
*St. Louis ..... 4.50-4.75

**Zinc**

New York ..... 3.00-3.25
*Cleveland ..... 3.50-3.75
St. Louis ..... 3.00-3.50

**Aluminum**

*Borings, Cleveland ..... 9.75-10.00
*Mixed cast, Cleve. ..... 12.75-13.00
*Clips, soft, Cleve. ..... 14.75-15.00
*Mixed, cast, St. L. ..... 13.00-13.25

**SECONDARY METALS**

Brass, ingot 85-5-5-5, lcl, 14.00
Stand. No. 12 alum. 18.50-19.00

# Warehouse Iron and Steel Prices

*Cents per pound for delivery within metropolitan districts of cities specified*

**STEEL BARS**

| | |
|---|---|
| Baltimore | 4.00c |
| Boston†† | 4.05c |
| Buffalo | 3.10c |
| Chattanooga | 4.21c |
| Chicago (j) | 3.85c |
| Cincinnati | 4.05c |
| Cleveland | 3.75c |
| Detroit | 3.93½c |
| Houston | 3.10c |
| Los Angeles | 4.30c |
| Milwaukee | 3.96c-4.11c |
| New Orleans | 4.20c |
| New York‡ (d) | 4.12c |
| Pitts. (h) | 3.80c |
| Philadelphia | 4.00c |
| Portland | 4.50c |
| San Francisco | 4.20c |
| Seattle | 4.45c |
| St. Louis | 4.09c |
| St. Paul | 4.10c-4.25c |
| Tulsa | 3.35c |

**IRON BARS**

| | |
|---|---|
| Portland | 3.50c |
| Chattanooga | 4.21c |
| Baltimore* | 3.25c |
| Cincinnati | 4.05c |
| New York‡ (d) | 3.65c |
| Philadelphia | 4.00c |
| St. Louis | 4.09c |
| Tulsa | 3.35c |

**REINFORCING BARS**

| | |
|---|---|
| Buffalo | 2.60c |
| Chattanooga | 4.21c |
| Cleveland (c) | 2.55c |
| Cincinnati | 3.75c |
| Houston | 3.25c |
| Los Angeles, c.l. | 2.975c |
| New Orleans* | 3.24c |
| Pitts., plain (h) | 2.55c |
| Pitts., twisted squares (h) | 3.95c |
| San Francisco | 2.97½c |
| Seattle | 2.975c |
| St. Louis | 3.99c |
| Tulsa | 3.25c |
| Young | 2.30c-2.60c |

**SHAPES**

| | |
|---|---|
| Baltimore | 3.90c |
| Boston†† | 3.92c |
| Buffalo | 3.35c |
| Chattanooga | 4.11c |
| Chicago | 3.75c |
| Cincinnati | 3.95c |
| Cleveland | 3.86c |
| Detroit | 3.95c |
| Houston | 3.10c |
| Los Angeles | 4.30c |
| Milwaukee | 3.86c |
| New Orleans | 4.10c |
| New York‡ (d) | 3.97c |
| Philadelphia | 3.90c |
| Pittsburgh (h) | 3.70c |
| Portland (i) | 4.25c |
| San Francisco | 4.05c |
| Seattle (i) | 4.25c |
| St. Louis | 3.99c |
| St. Paul | 4.00c |
| Tulsa | 3.60c |

**PLATES**

| | |
|---|---|
| Baltimore | 3.90c |
| Boston†† | 3.93c |
| Buffalo | 3.47c |
| Chattanooga | 4.11c |
| Chicago | 3.75c |
| Cincinnati | 3.95c |
| Cleveland, ¼-in. and over | 3.86c |
| Detroit | 3.95c |
| Detroit, 3/16-in. | 4.15c |
| Houston | 3.10c |
| Los Angeles | 4.30c |
| Milwaukee | 3.86c |
| New Orleans | 4.10c |
| New York‡ (d) | 4.00c |
| Philadelphia | 3.90c |
| Phila. floor | 4.95c |
| Pittsburgh (h) | 3.70c |
| Portland | 4.25c |
| San Francisco | 4.05c |
| Seattle | 4.25c |
| St. Louis | 3.99c |
| St. Paul | 4.00c |
| Tulsa | 3.60c |

**NO. 10 BLUE**

| | |
|---|---|
| Baltimore | 3.95c |
| Boston (g) | 4.00c |
| Buffalo | 3.72c |
| Chattanooga | 4.16c |
| Chicago | 3.85c |
| Cincinnati, | 4.00c |
| Cleveland | 3.91c |
| Det. 8-10 ga. | 3.93½c |
| Houston | 3.45c |
| Los Angeles | 4.50c |
| Milwaukee | 3.96c |
| New Orleans | 4.35c |
| New York‡ (d) | 4.07c |
| Portland | 4.25c |
| Philadelphia | 4.00c |
| Pittsburgh (h) | 3.75c |
| San Francisco | 4.30c |
| Seattle | 4.50c |
| St. Louis | 4.39c |
| St. Paul | 4.10c |
| Tulsa | 3.80c |

**NO. 24 BLACK**

| | |
|---|---|
| Baltimore*† | 4.50c |
| Boston (g) | 4.75c |
| Buffalo | 3.35c |
| Chattanooga* | 4.06c |
| Chicago | 4.45c-5.10c |
| Cincinnati | 4.75c |
| Cleveland | 4.66c |
| Detroit | 4.68½c |
| Los Angeles | 5.05c |
| Milwaukee | 4.56c-5.21c |
| New York‡ (d) | 4.82c |
| Philadelphia | 4.65c |
| Pitts.** (h) | 4.75c |
| Portland | 5.15c |
| Seattle | 5.35c |
| San Francisco | 5.15c |
| St. Louis | 4.84c |
| St. Paul | 4.75c |
| Tulsa | 4.85c |

**NO. 24 GALV. SHEETS**

| | |
|---|---|
| Baltimore*† | 4.70c |
| Buffalo | 4.10c |
| Boston (g) | 5.30c |
| Chattanooga* | 4.76c |
| Chicago (h) | 5.10c-5.75c |
| Cincinnati | 5.40c |
| Cleveland | 5.31c |
| Detroit | 5.40c |
| Houston | 4.50c |
| Los Angeles | 5.75c |
| Milwaukee | 5.21c-5.86c |
| New Orleans* | 5.75c |
| New York‡ (d) | 5.47c |
| Philadelphia | 5.30c |
| Pitts.** (h) | 5.40c |
| Portland | 5.90c |
| San Francisco | 5.85c |
| Seattle | 5.90c |
| St. Louis | 5.49c |
| St. Paul | 5.40c |
| Tulsa | 5.20c |

**BANDS**

| | |
|---|---|
| Baltimore | 4.20c |
| Boston†† | 4.25c |
| Buffalo | 3.52c |
| Chattanooga | 4.41c |
| Cincinnati | 4.25c |
| Cleveland | 4.16c |
| Chicago | 4.10c |
| Detroit, 1/16-in. and lighter | 4.185c |
| Houston | 3.35c |
| Los Angeles | 4.80c |
| Milwaukee | 4.21c |
| New Orleans | 4.75c |
| New York‡ (d) | 4.32c |
| Philadelphia | 4.10c |
| Pittsburgh (h) | 4.00c |
| Portland | 5.00c |
| San Francisco | 4.80c |
| Seattle | 4.95c |
| St. Louis | 4.34c |
| St. Paul | 4.35c |
| Tulsa | 3.55c |

**HOOPS**

| | |
|---|---|
| Baltimore | 4.45c |
| Boston†† | 5.25c |
| Buffalo | 3.52c |
| Chicago | 4.10c |
| Cincinnati | 4.25c |
| Detroit, No. 14 and lighter | 4.185c |
| Los Angeles | 6.55c |
| Milwaukee | 4.21c |
| New York‡ (d) | 4.32c |
| Philadelphia | 4.35c |
| Pittsburgh (h) | 4.50c |
| Portland | 6.50c |
| San Francisco | 6.50c |
| Seattle | 6.30c |
| St. Louis | 4.34c |
| St. Paul | 4.35c |

**COLD FIN. STEEL**

| | |
|---|---|
| Baltimore (c) | 4.50c |
| Boston* | 4.65c |
| Buffalo (h) | 3.70c |
| Chattanooga* | 4.86c |
| Chicago (h) | 4.30c |
| Cincinnati | 4.50c |
| Cleveland (h) | 4.30c |
| Detroit | 4.30c |
| Los Ang. (f) (d) | 6.85c |
| Milwaukee | 4.41c |
| New Orleans | 5.10c |
| New York‡ (d) | 4.57c |
| Philadelphia | 4.53c |
| Pittsburgh | 4.15c |
| Portland (f) (d) | 7.10c |
| San Fran. (f) (d) | 6.80c |
| Seattle (f) (d) | 7.10c |
| St. Louis | 4.54c |
| St. Paul | 4.77c |
| Tulsa | 4.80c |

**COLD ROLLED STRIP**

| | |
|---|---|
| Boston | 3.845c |
| Buffalo | 3.39c |
| Chicago | 3.87c |
| Cincinnati | 3.82c |
| Cleveland (b) | 3.60c |
| Detroit | 3.43c |
| New York‡ (d) | 3.92c |
| St. Louis | 4.54c |

**TOOL STEELS**

(Applying on or east of Mississippi river; west of Mississippi 1c up.)

| | Base |
|---|---|
| High speed | 69c |
| High carbon, Cr. | 45c |
| Oil hardening | 26c |
| Special tool | 24c |
| Extra tool | 20c |
| Regular tool | 16c |
| Water hardening | 12½c |

Uniform extras apply.

**BOLTS AND NUTS**

| (100 pounds or over) | Discount |
|---|---|
| Chicago (a) | 55 to 60 |
| Cleveland | 60-5-5 |
| Detroit | 70-10 |
| Milwaukee | 60 to 65 |
| New Orleans | 65 |
| Pittsburgh | 65-5 |

(a) Under 100 lbs., 50 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 0.15c higher.

On plates, shapes, bars, hot strip and blue annealed quantity extras and discounts as follows: Under 100 lbs., add $1.50; 100 to 399 lbs., add 50c; 400 to 3999 lbs., base; 4000 to 9999 lbs., deduct 10c; over 10,000 lbs., deduct 15c. At Cleveland, under 400 lbs., add 50c, with $1 minimum invoice.

‡Domestic steel; *Plus quantity extras; **One to 9 bundles; *† 50 or more bundles; †New extras apply; ††Base 10,000 lbs., extras on less.

# Current Iron and Steel Prices of Europe

**Dollars at Rates of Exchange, July 8**

## Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

| | British gross tons U. K. ports £ s d | Continental Channel or North Sea ports, metric tons: Quoted in dollars at current value | Continental: **Quoted in gold pounds sterling £ s d |
|---|---|---|---|
| **PIG IRON** | | | |
| Foundry, 2.50-3.00 Silicon | $30.31 6 2 6 | $32.60 | 4 1 0 |
| Basic bessemer | 19.39 3 18 6* | 30.99 | 3 17 0 |
| Hematite, Phos. .03-.05 | 21.61 4 7 6 | ..... | ..... |
| **SEMIFINISHED STEEL** | | | |
| Billets | $38.90 7 17 6 | $35.27 | 4 7 6 |
| Wire rods, No. 5 gage | 53.48 10 16 6 | 55.86 | 6 10 0 |
| **FINISHED STEEL** | | | |
| Standard rails | $50.02 10 2 6 | $48.36 | 6 0 0 |
| Merchant bars | 2.43c 11 0 0 | 1.82c | 5 0 0 |
| Structural shapes | 2.35c 10 12 6 | 1.77c | 4 17 6 |
| Plates, †¼ in. or 5 mm. | 2.55c 11 11 3 | 2.24c | 6 2 6 |
| Sheets, black, 24 gage or 0.5 mm | 3.31c 15 0 0 | 3.19c | 8 15 0†† |
| Sheets, gal., 24 gage, corr. | 4.14c 18 15 0 | 3.97c | 11 10 0 |
| Bands and strips | 3.04c 13 15 0 | 2.37c | 6 10 0 |
| Plain wire, base | 3.20c 14 10 0 | 2.55c | 7 0 0 |
| Galvanized wire, base | 3.76c 17 0 0 | 3.19c | 8 15 0 |
| Wire nails, base | 3.09c 14 0 0 | 2.92c | 8 0 0 |
| Tin plate, box 108 lbs. | $ 6.18 1 5 0 | ..... | ..... |

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid.

## Domestic Prices at Works or Furnace—Last Reported

| | £ s d | French Francs | | Belgian Francs | | Reich Marks |
|---|---|---|---|---|---|---|
| Fdy. pig iron, Si. 2.5 | $24.94 5 1 0(a) | $16.32 | 425 | $27.88 | 825 | $25.26 63 |
| Basic bessemer pig iron | 24.70 5 0 0(a) | 9.56 | 275 | 14.70 | 435 | 27.87 (b) 69.50 |
| Furnace coke | 8.77 1 15 6 | 6.06 | 158 | 6.25 | 185 | 7.62 19 |
| Billets | 38.90 7 17 6 | 25.15 | 655 | 28.22 | 835 | 38.70 96.50 |
| Standard rails | 2.24c 10 2 6 | 1.70c | 975 | 1.80c | 1,200 | 2.38c 132 |
| Merchant bars | 2.53c 11 9 0 | 1.54c | 885 | 1.46c | 975 | 1.98c 110 |
| Structural shapes | 2.44c 11 0 6 | 1.49c | 860 | 1.46c | 975 | 1.93c 107 |
| Plates, †¼-in. or 5 mm. | 2.59c 11 14 3 | 1.92c | 1,105 | 1.87c | 1,245 | 2.29c 127 |
| Sheets, black | 3.48c 15 15 0§ | 2.52c | 1,400 | 2.19c | 1,460‡ | 2.59c 144 |
| Sheets, galv., corr., 24 ga. or 0.5 mm. | 4.31c 19 10 0 | 3.74c | 2,150 | 2.85c | 1,900 | 6.66c 370 |
| Plain wire | 3.20c 14 10 0 | 2.36c | 1,360 | 2.48c | 1,650 | 3.11c 173 |
| Bands and strips | 2.70c 12 4 0 | 1.74c | 1,000 | 2.33c | 1,550 | 2.29c 127 |

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel, a del. Middlesbrough. b hemetite. ††Close annealed.

**Gold pound sterling carries a premium of 65.36 per cent over paper sterling.

# Iron and Steel Scrap Prices

*Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices*

**HEAVY MELTING STEEL**

| | |
|---|---|
| Birmingham†, No. 1 | 14.00-14.50 |
| Birmingham†, No. 2 | 13.00-13.25 |
| Bos. dock No. 1, exp. | 16.00 |
| N. Eng. del. No. 1 | 14.50 |
| Buffalo, No. 1 | 18.00-19.00 |
| Buffalo, No. 2 | 16.00-17.00 |
| Chicago, No. 1 | 16.00-16.50 |
| Cleveland, No. 1 | 17.00-17.50 |
| Cleveland, No. 2 | 15.50-16.00 |
| Detroit, No. 1 | 15.50-16.00 |
| Eastern Pa., No. 1 | 18.00-18.50 |
| Eastern Pa., No. 2 | 16.00-16.50 |
| Federal, Ill. | 13.50-14.00 |
| Granite City, R. R. | 15.25-15.75 |
| Granite City, No. 2 | 13.50-14.00 |
| New York, No. 1 | †14.25-14.75 |
| N.Y. dock, No. 1 exp. | 15.00-15.50 |
| Pitts., No. 1 (R. R.) | 20.50-21.00 |
| Pitts., No. 1 (dir.) | 19.00-19.50 |
| Pittsburgh, No. 2 | 16.50-17.00 |
| St. Louis, R. R. | 15.25-15.75 |
| St. Louis, No. 2 | 13.50-14.00 |
| Toronto, dlrs. No. 1 | 11.00-12.00 |
| Toronto, No. 2 | 10.00-11.00 |
| Valleys, No. 1 | 18.00-18.50 |

**COMPRESSED SHEETS**

| | |
|---|---|
| Buffalo, dealers | 16.00-17.00 |
| Chicago, factory | 15.50-16.00 |
| Chicago, dealer | 15.00-15.50 |
| Cleveland | 16.00-16.50 |
| Detroit | 16.00-16.50 |
| E. Pa., new mat. | 17.50-18.00 |
| E. Pa., old mat. | 14.50 |
| Pittsburgh | 19.00-19.50 |
| St. Louis | 11.00-11.50 |
| Valleys | 17.00-17.50 |

**BUNDLED SHEETS**

| | |
|---|---|
| Buffalo | 13.00-13.50 |
| Cincinnati, del. | 13.50-14.00 |
| Cleveland | 13.50-14.00 |
| Pittsburgh | 16.25-16.75 |
| St. Louis | 9.50-10.00 |
| Toronto, dealers | 8.00 |

**SHEET CLIPPINGS, LOOSE**

| | |
|---|---|
| Chicago | 11.00-11.50 |
| Cincinnati | 11.50-12.00 |
| Detroit | 10.75-11.25 |
| St. Louis | 9.00- 9.50 |

**STEEL RAILS, SHORT**

| | |
|---|---|
| Birmingham | 17.00-18.00 |
| Buffalo | 23.50-24.00 |
| Chicago (3 ft.) | 19.50-20.00 |
| Chicago (2 ft.) | 20.00-20.50 |
| Cincinnatai, del. | 20.50-21.00 |
| Detroit | 18.50-19.00 |
| Pitts., 3 ft. and less | 24.00-24.50 |
| St. Louis, 2 ft. & less | 18.50-19.00 |

**STEEL RAILS, SCRAP**

| | |
|---|---|
| Boston district | †14.00-14.25 |
| Buffalo | 19.50-20.00 |
| Chicago | 16.00-16.50 |
| Cleveland | 21.00-21.50 |
| Pittsburgh | 20.75-21.25 |
| St. Louis | 16.50-17.00 |

**STOVE PLATE**

| | |
|---|---|
| Birmingham | 10.00-10.50 |
| Boston district | †9.00- 9.50 |
| Buffalo | 14.50-15.00 |
| Chicago | 10.50-11.00 |
| Cincinnati, dealers | 10.50-11.00 |
| Detroit, net | 11.25-11.75 |
| Eastern Pa. | 14.50-15.00 |
| New York, fdry. | †10.50-11.00 |
| St. Louis | 11.00-11.50 |
| Toronto, deal'rs, net | 9.50-10.00 |

**SPRINGS**

| | |
|---|---|
| Buffalo | 22.00-22.50 |
| Chicago, leaf | 20.00-20.50 |
| Chicago, coil | 21.00-21.50 |
| Eastern Pa. | 24.00-24.50 |
| Pittsburgh | 24.50-25.00 |
| St. Louis | 19.50-20.00 |

**ANGLE BARS—STEEL**

| | |
|---|---|
| Chicago | 18.00-18.50 |
| St. Louis | 17.00-17.50 |

**RAILROAD SPECIALTIES**

| | |
|---|---|
| Chicago | 18.50-19.00 |

**LOW PHOSPHORUS**

| | |
|---|---|
| Buffalo, billet and bloom crops | 22.00-23.00 |
| Cleveland, billet, bloom crops | 24.00-24.50 |
| Eastern Pa., crops | 22.50-23.00 |
| Pittsburgh, billet, bloom crops | 25.00-25.50 |
| Pittsburgh, sheet bar crops | 24.50-25.00 |

**FROGS, SWITCHES**

| | |
|---|---|
| Chicago | 15.50-16.00 |
| St. Louis, cut | 17.00-17.50 |

**SHOVELING STEEL**

| | |
|---|---|
| Chicago | 15.75-16.25 |
| Federal, Ill. | 13.50-14.00 |
| Granite City, Ill. | 13.50-14.00 |
| Toronto, dealers | 9.00- 9.50 |

**RAILROAD WROUGHT**

| | |
|---|---|
| Birmingham | 13.50-14.00 |
| Boston district | †10.00-10.25 |
| Buffalo, No. 1 | 16.00-17.00 |
| Buffalo, No. 2 | 18.00-19.00 |
| Chicago, No. 1 net | 15.00-15.50 |
| Chicago, No. 2 | 15.50-16.00 |
| Cincinnati, No. 2 | 15.00-15.50 |
| Eastern Pa., No. 1 | 18.50-19.00 |
| St. Louis, No. 1 | 13.00-13.50 |
| St. Louis, No. 2 | 15.25-15.75 |
| Toronto, No. 1 dlr. | 15.00 |

**SPECIFICATION PIPF**

| | |
|---|---|
| Eastern Pa. | 16.50-17.00 |
| New York | †12.50-13.00 |

**BUSHELING**

| | |
|---|---|
| Buffalo, No. 1 | 16.00-17.00 |
| Chicago, No. 1 | 14.00-14.50 |
| Cincin., No. 1, deal. | 15.00-15.50 |
| Cincinnati, No. 2 | 8.50- 9.00 |
| Cleveland, No. 2 | 12.00-12.50 |
| Detroit, No. 1 new | 15.00-15.50 |
| Valleys, new, No. 1 | 16.50-17.00 |
| Toronto, dealers | 9.00 |

**MACHINE TURNINGS**

| | |
|---|---|
| Birmingham | 6.00- 7.00 |
| Buffalo | 11.25-11.75 |
| Chicago | 8.50- 9.00 |
| Cincinnati, dealers | 9.50-10.00 |
| Cleveland | 11.75-12.25 |
| Detroit | 10.75-11.25 |
| Eastern Pa. | 13.00 |
| New York | †8.50- 9.00 |
| Pittsburgh | 14.00-14.50 |
| St. Louis | 7.50- 8.00 |
| Toronto, dealers | 8.00- 8.50 |
| Valleys | 13.00-13.50 |

**BORINGS AND TURNINGS**

*For Blast Furnace Use*

| | |
|---|---|
| Boston district | †7.75- 8.25 |
| Buffalo | 12.75-13.25 |
| Cincinnati, dealers | 9.00- 9.50 |
| Cleveland | 12.00-12.50 |
| Detroit | 11.00-11.50 |
| Eastern Pa. | 12.00-12.50 |
| New York | †8.00- 8.50 |
| Pittsburgh | 14.50-15.00 |
| Toronto, dealers | 8.00- 8.50 |

**CAST IRON BORINGS**

| | |
|---|---|
| Birmingham | 7.50- 8.00 |
| Boston dist. chem. | †9.50-10.00 |
| Boston dist. for mills | †9.00 |
| Buffalo | 12.75-13.25 |
| Chicago | 9.75- 10.25 |
| Cincinnati, dealers | 9.00- 9.50 |
| Cleveland | 12.00-12.50 |
| Detroit | 11.00-11.50 |
| E. Pa., chemical | 14.50-15.00 |
| New York | †8.00- 8.50 |
| St. Louis | 7.00- 7.50 |
| Toronto, dealers | 9.00 |

**PIPE AND FLUES**

| | |
|---|---|
| Cincinnati, dealers | 12.00-12.50 |
| Chicago, net | 13.00-13.50 |

**RAILROAD GRATE BARS**

| | |
|---|---|
| Buffalo | 14.00-14.50 |
| Chicago, net | 12.00-12.50 |
| Cincinnati | 11.00-11.50 |
| Eastern Pa. | 14.50-15.00 |
| New York | †10.00-10.50 |
| St. Louis | 11.50-12.00 |

**FORGE FLASHINGS**

| | |
|---|---|
| Boston district | †10.75 |
| Buffalo | 16.00-17.00 |
| Cleveland | 15.50-16.00 |
| Detroit | 14.00-14.50 |
| Pittsburgh | 16.50-17.00 |

**FORGE SCRAP**

| | |
|---|---|
| Boston district | †8.00- 8.50 |
| Chicago, heavy | 19.50-20.00 |
| Eastern Pa. | 16.00-16.50 |

**ARCH BARS, TRANSOMS**

| | |
|---|---|
| St. Louis | 18.00-18.50 |

**AXLE TURNINGS**

| | |
|---|---|
| Boston district | †11.00-11.50 |
| Buffalo | 16.00-16.50 |
| Chicago, elec. fur. | 15.50-16.00 |
| Eastern Pa. | 16.00-16.50 |
| St. Louis | 12.00-12.50 |
| Toronto | 9.50 |

**STEEL CAR AXLES**

| | |
|---|---|
| Birmingham | 19.00-20.00 |
| Buffalo | 22.00-22.50 |
| Boston district | †20.00 |
| Chicago, net | 22.00-22.50 |
| Eastern Pa. | 25.00-26.00 |
| St. Louis | 21.50-22.00 |

**SHAFTING**

| | |
|---|---|
| Boston district | †18.00-18.50 |
| New York | †19.00-19.50 |
| Eastern Pa. | 23.50-24.00 |
| St. Louis | 14.00-14.50 |

**CAR WHEELS**

| | |
|---|---|
| Birmingham | 18.00-19.00 |
| Boston dist., iron | †15.00-15.25 |
| Buffalo, iron | 18.50-19.50 |
| Buffalo, steel | 22.50-23.00 |
| Chicago, iron | 18.00-18.50 |
| Chicago, rolled steel | 19.00-19.50 |
| Cincinnati, iron | 18.50-19.00 |
| Eastern Pa., iron | 19.00-19.50 |
| Eastern Pa., steel | 22.50-23.00 |
| Pittsburgh, iron | 20.25-20.75 |
| Pittsburgh, steel | 24.50-25.00 |
| St. Louis, iron | 17.00-17.50 |
| St. Louis, steel | 19.00-19.50 |

**NO. 1 CAST SCRAP**

| | |
|---|---|
| Birmingham | 15.50-16.00 |
| Boston, No. 1 mach. | †14.50 |
| N. Eng. del. No. 2. | 16.50 |
| N. Eng. del. textile. | 18.50 |
| Buffalo, cupola | 17.50-18.00 |
| Buffalo, mach. | 18.50-19.00 |
| Chicago, agri. net | 13.00-13.50 |
| Chicago, auto | 14.00-14.50 |
| Chicago, mach. net. | 14.50-15.00 |
| Chicago, railr'd net. | 14.00-14.50 |
| Cincin., mach. cup. | 15.50-16.00 |
| Cleveland, mach. | 19.00-19.50 |
| Eastern Pa., cupola. | 19.00-19.50 |
| E. Pa., mixed yard | 17.00-17.50 |
| Pittsburgh, cupola | 18.50-19.00 |
| San Francisco, del. | 13.50-14.00 |
| Seattle | 12.00-13.00 |
| St. Louis, No. 1 | 14.50-15.00 |
| St. L., No. 1, mach. | 14.00-14.50 |
| Toronto, No. 1, mach., net | 16.00-17.00 |

**HEAVY CAST**

| | |
|---|---|
| Boston dist. break. | †13.25-13.50 |
| N. Eng. del. | 15.00-15.25 |
| Buffalo, break. | 15.00-15.50 |
| Cleveland, break. | 13.50-14.00 |
| Detroit, break. | 13.50-14.00 |
| Detroit, auto net. | 14.50-15.00 |
| Eastern Pa. | 18.00-18.50 |
| New York, break. | †14.50-14.75 |
| Pittsburgh | 14.50-15.00 |

**MALLEABLE**

| | |
|---|---|
| Birmingham, R. R. | 12.50-13.50 |
| New England, del. | 20.00 |
| Buffalo | 20.00-21.00 |
| Chicago, R. R. | 18.50-19.00 |
| Cincin., agri. del. | 15.50-16.00 |
| Cleveland, rail | 20.50-21.00 |
| Detroit, auto | 15.00-15.50 |
| Eastern Pa., R. R. | 19.00-20.00 |
| Pittsburgh, rail | 20 50-21.00 |
| St. Louis, R. R. | 18.00-18.50 |

**RAILS FOR ROLLING**

*5 feet and over*

| | |
|---|---|
| Birmingham | 18.00-19.00 |
| Boston | †17.50-18.00 |
| Buffalo | 19.50-20.00 |
| Chicago | 19.00-19.50 |
| Eastern Pa., R. R. | 21.00-21.50 |
| New York | †17.00-17.50 |
| St. Louis | 18.00-18.50 |

**LOCOMOTIVE TIRES**

| | |
|---|---|
| Chicago (cut) | 20.50-21.00 |
| St. Louis, No. 1 | 17.50-18.00 |

**LOW PHOS. PUNCHINGS**

| | |
|---|---|
| Buffalo | 22.00-22.50 |
| Chicago | 19.50-20.00 |
| Eastern Pa. | 24.00-24.50 |
| Pittsburgh (heavy) | 22.50-23.00 |
| Pittsburgh (light) | 22.00-22.50 |

## Iron Ore

**Lake Superior Ore**

*Gross ton, 51½%*

*Lower Lake Ports*

| | |
|---|---|
| Old range bessemer | $5.25 |
| Mesabi nonbess. | 4.95 |
| High phosphorus | 4.85 |
| Mesabi bessemer | 5.10 |
| Old range nonbess. | 5.10 |

**Eastern Local Ore**

*Cents, unit, del. E. Pa.*

| | |
|---|---|
| Foundry and basic 56.63% con. | 9.00-10.00 |
| Cop.-free low phos. 58-60% | nominal |

**Foreign Ore**

*Cents per unit, f.a.s. Atlantic*

| | |
|---|---|
| Foreign manganiferous ore, 45.55% iron, 6-10% man. | *17.00 |
| No. Afr. low phos. | 17.50 |
| Swedish low phos. | nominal |
| Spanish No. Africa basic, 50 to 60% | *16.00 |
| Tungsten, Nov.-Dec. sh. ton, unit, duty pd. $22.00 to $23.00; spot non. | |
| N. F., fdy., 55% | 7.00 |
| Chrome ore, 48% gross ton, c.i.f. | $25.50-26.50 |

*Nominal asking price for spot.

## Manganese Ore

*(Nominal)*

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% . . . . . non. .52.00 to 53.00

So. African, 50-52% . . . . . non. 52.00 to 53.00

Indian, 50-52% . . . . . Nominal

# Sheets

Sheet Prices, Page 84

**Pittsburgh**—With new business lighter recently, sheet producers have cut into backlogs, but the reduction has not yet been extensive enough to shorten delivery promises on grades most in demand. Pressure for earlier shipments is still being exerted by consumers. Inquiries for export have been better. Some buying has been done by the automotive industry for 1938 models but most of this is still in the future. Some mill deliveries range up to 22 weeks on hot-rolled; 22 to 23 weeks on galvanized and light hot-rolled, and 11 to 12 weeks on cold-reduced. Operations of common black mills continue between 70 and 75 per cent, and galvanized at 70.

**Cleveland**—Sheet mill operations remain at close to capacity, despite the decline in specifications, particularly from automotive sources. However, extensive backlogs will warrant high operating schedules through July, by which time renewed buying from auto manufacturers is expected. At least one seller is unable to offer deliveries on cold-rolled in less than 10 weeks and hot-rolled material well into October. However, most mills are in much better position and can make deliveries in about half that time.

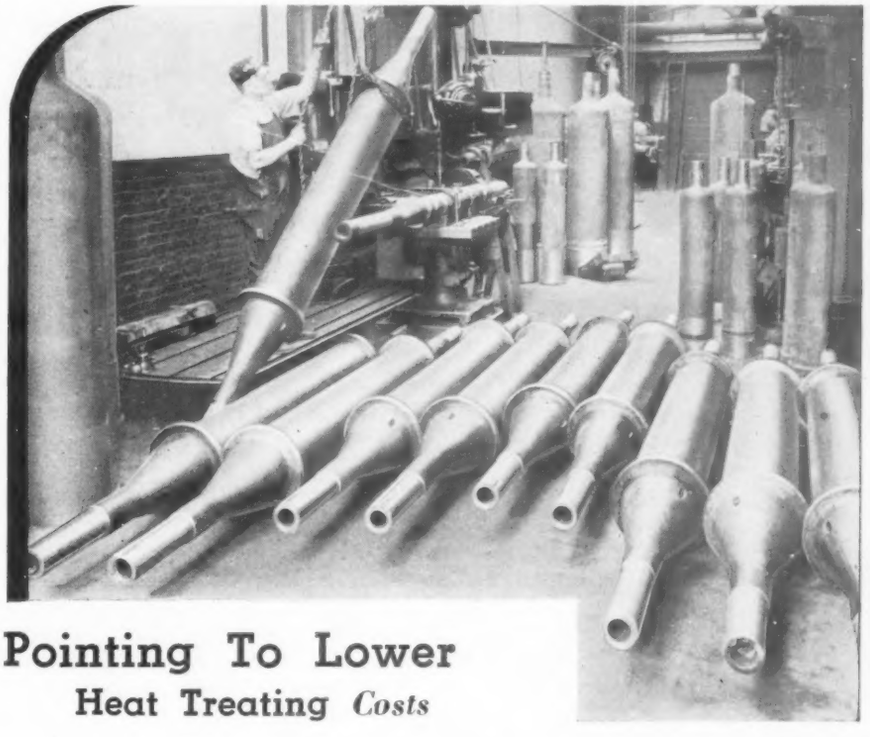
**Chicago**—Resumption of Inland Steel Co. mill is believed to indicate a hoped-for easing in delivery dates for steel sheets of all grades which currently are three or four months behind. The requirements of a wide miscellaneous group of consumers of steel sheets continue to be urged upon mills and indicate a continued busy summer and well into the autumn.

**New York**—Despite much less interest in new tonnage, sheet consumers are exerting fairly good pressure for tonnage under contract, placed in many instances last spring. Indicative of the rate at which most metalworking shops have been operating, at least until recently, is the report of one large district seller which showed specifications in June as being heavier than in May. Deliveries are improving, with the situation the tightest in galvanized sheets, among the more ordinary grades. Practically all sellers are booked up over the remainder of this quarter on galvanized and in some cases into fourth quarter. Incidentally, certain leading sellers continue to adhere to their policy of not quoting for delivery beyond the end of the current quarter, although others have been doing it for some time where necessary, with prices ruling at time of delivery.

**Boston**—Sheet buying has slackened. With deliveries improved and consumer stocks heavier in most instances, there has also been some drop in consumption. Special sheets for large metal piping are fairly active. Some small tank fabricators are covering for several weeks but are specifying lightly. Miscellaneous orders are about in line with reduced consumption.

**Philadelphia** — Preliminary releases on sheets for 1938 automobiles are reported by auto body builders here. In general, however, sheet activity shows further tapering with buying and specifications easing. Most mills now are able to offer more favorable delivery dates on hot-rolled as well as cold-rolled material. The average is around four to five weeks on cold-rolled, six to eight on hot-rolled and slightly longer on hot-rolled annealed. Even better delivery may be had in one or two directions.

**Cincinnati**—Before the holiday, ordering of sheets was near district mill capacity but last week purchasing was dull. Backlogs and interest in buying indicate capacity levels for several weeks, if not

**Pointing To Lower Heat Treating *Costs***

From slow speed to high speed—from *low* heat to high heat—, but from high costs to *low costs*

When Cimet roller shafts are used you are pointing to lower heat-treating costs—

The shafts shown in the illustration are made of "Cimet" and are used with gas fuel in a roller type heat-treating furnace operating at 1800°F.

These normalizing shafts are cast in one piece to give longer uninterrupted service—

"Cimet" is the nickel chromium alloy to use for normalizing atmospheres under operating conditions up to 1900° F.—

DRIVER-HARRIS COMPANY

HARRISON, N. J.

Chicago Detroit Cleveland England France Italy

throughout the quarter. Delivery positions vary, hot-rolled annealed being extended to the end of the quarter, but cold-rolled is available promptly.

**St. Louis**—Sheet buying, particularly heavier gages, has tapered in about the expected seasonal volume. Shipments, however, continue heavy and backlogs are sufficient to support the recent rate of production for some time. Galvanized sheets are moving in substantial volume, with some inquiry for third quarter.

**Birmingham, Ala.**—Sheet mill operations continue at and above rated capacity, although June saw some fluctuation in buying.

## Strip

Strip Prices, Page 85

**Pittsburgh**—Strip producers' bookings continue light with an order or two from the automotive industry the principal feature. While most recent automotive business has been fill-in orders for rounding out production of 1937 models, part of the material ordered is for 1938 cars. Miscellaneous consumers generally continue active, but are more content to stick to actual needs. Shipments of most mills exceeded bookings in the latter part of June, but one producer reported an increase of approximately 6 per cent in new business in the last week of June, compared to the preceding four weeks, making June better than May.

**Cleveland** — Deliveries on hot-rolled strip range between three and four weeks in most instances, the best that can be obtained on any flat-rolled products. Specifications from auto partsmakers have been particularly slow, due to the approaching model changeover. However, requirements from miscellaneous sources, particularly small farm tool and electrical equipment manufacturers, have resisted seasonal influences better than anticipated. Current orders are for early delivery with most consumers hesitant in covering for third quarter requirements.

**Chicago**—Shipments of both hot and cold-rolled strip are keeping up remarkably well, especially in medium and narrower widths. Most interest at the moment is centered upon the automobile industry which continues to take strip in a slightly increased measure due to the maintenance of old model production. Deliveries are good.

**Boston**—Narrow cold strip buying continues at about the recent rate, incoming business being for early delivery as a rule. Demand is well distributed among industrial users. Mill backlogs, while lower, are still sufficient for high operation in most departments. Deliveries are about normal with shipments more in line with new business. Prices are firm and unchanged.

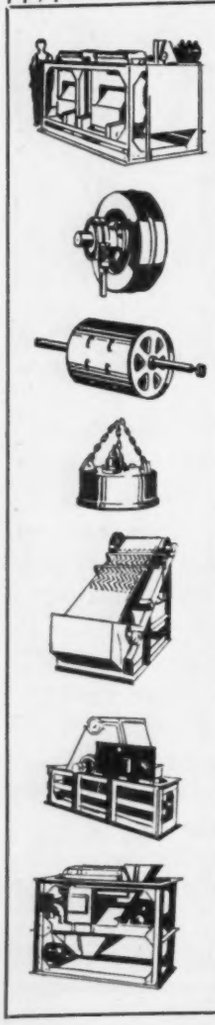
**New York**—Buying activity is barely maintained for cold-rolled strip. Shipments have declined materially at some mills, yet remain considerably heavier than incoming orders. Deliveries are normal on a larger list of specifications. It is apparent that consumption by many fabricators has declined. This, coupled with fair stocks held by the larger buyers, has eliminated any element of uncertainty as to needs in the immediate future, and has acted as a brake on forward buying. Most current business is for early delivery and prices are firm.

**Philadelphia**—Incoming strip business is relatively light and largely of a fill-in character. Consumers are showing no anxiety over late third quarter needs inasmuch as stocks are said to be ample for current requirements and delivery on new commitments may be had within two or three weeks.


HIGH STEARNS DUTY

*MAGNETIC EQUIPMENT*

**WHATEVER YOUR NEED**
**WHATEVER YOUR JOB**
**Investigate**
**STEARNS MAGNETIC**



**Separators** **Clutches**
**Drums** **Brakes**
**Rolls** **Special Magnets**

Thirty-five years of practical pioneering magnetic engineering experience is back of the Stearns High Duty trade mark.

Constant development and research by Stearns engineers, together with extensive laboratory facilities, has been responsible for much of the present day wide-spread utilization of magnetic equipment.

Investigate Stearns products. Consult magnetic headquarters. Avail yourself of Stearns magnetic equipment whether for separation, protection, purification, reclamation, power transmission or special magnetic appliances. You can be sure of receiving high maximum operating efficiency at low costs, an improved product with a definitely profitable investment.

*Write for our bulletin,*
*"The House of Magnetic Magic."*

**Stearns Magnetic Mfg. Co.**
Formerly Magnetic Mfg. Co.
650 S. 28th Street Milwaukee, Wis

# Plates

Plate Prices, Page 84

**Philadelphia**—Some platemakers report new business is holding up surprisingly well although the general tendency is downward. Current business mostly is of a miscellaneous character with orders for mill sizes reported outstanding. A few fair jobs are pending but not much tank or pipe line work. Mill order backlogs have been worked down further but still are substantial as indicated by the fact that some interests can offer little better than ten weeks on deliveries. However, universal plates are available within three to five weeks and sheared within four to six. Incidentally, it is understood that some of the ships included in the government financed building program will be placed with Pacific Coast yards. This program is not likely to shape up for some time, however.

**Pittsburgh**—Since the placing of 13,000 tons of plates for three tankers with the leading interest here last month the plate market has not been spectacular, but railroad car shop requirements are slightly better and small miscellaneous demand is steady. Backlogs of tank fabricators and boiler shops are good. Contrary to last year at this time, barge makers' backlogs are well depleted. Plate deliveries on some sizes range ten weeks or higher. Plates are quoted 2.25c, base, Pittsburgh.

**Cleveland** — Plate deliveries in most mills average approximately 10 weeks, although in some instances, if a particularly attractive tonnage is offered, shipments can be made in possibly half that time. Miscellaneous requirements have held up well in contrast with some other products. Mills are expected to continue to remain at practical capacity through the remainder of this month, with a possible tapering in the latter part of August if the anticipated resumption in railroad buying does not materialize.

**Chicago**—Demand for steel plates continues satisfactory and mills are able to promise deliveries within 60 days. Considerable standard plate business is moving to miscellaneous users, such as tank and tractor builders, while railroads are placing requirements from time to time.

**New York**—Back-to-work movement at several of the leading local ship yards, recently tied up by labor strikes, has resulted in the release of some fair plate specifications. It is believed that practically all of the yards in this district will be operating at close to normal in another week, with further beneficial effects on plate tonnage. Plate buying in general still lags, however and until some oil refinery work and new ship construction now contemplated is awarded, buying is expected to be restricted. Plate deliveries are noticeably easier, despite generally good mill backlogs, and producers are consequently showing more interest in foreign inquiry, particularly inasmuch as such tonnage usually can demand a premium, in some cases recently $3 and $4 over the domestic market. The largest foreign award to be noted recently involved 6000 tons of locomotive plates for Russia, distributed among at least three mills.

**Boston**—Lacking large specified tonnage projects, most shipyards excepted, plate demand is supported largely by a smaller miscellaneous demand. Mills are still far apart in ability to make deliveries, and, while pressure for material has abated somewhat, some consumers appear to be disregarding usual mill connections and are placing orders with those promising early shipment.

**Birmingham, Ala.** — Output of plate is well booked for third quar-

PERKINS
MAN
COOLER
Trade Mark
Reg. U. S. Pat. Off.
PERKINS MAN COOLERS, recognized as the most efficient appliance for bringing comfort to workers in hot places, are proving a vital factor in production. They are keeping men comfortably at work in the hottest places, reducing labor turnover, speeding production.
Made in OSCILLATING and STATIONARY types, (both portable).
B. F. PERKINS & SON, Inc. HOLYOKE, MASS.

ter. While specifications over the past two weeks have not been heavy, absence of strikes has been reflected in the production schedule.

**Seattle**—Construction of steel oil carrying barges is expected to call for considerable tonnage during the next six months. Tidewater Transportation Co. will construct nine such units at Attalia, Wash., for service on the Columbia river and about 800 tons of plates will be furnished by Bethlehem Steel Co., Seattle. Shops have a fair volume of work for small tanks and ship repair jobs involve a normal tonnage.

## Plate Contracts Placed

800 tons, nine oil carrying barges for Tidewater Transportation Co., Spokane, Wash., to Bethlehem Steel Co., Seattle.

100 tons, buoys, lighthouse, Staten Island, N. Y., to R. D. Cole Mfg. Co., Newnan, Ga.

## Turbine Price Increased

Westinghouse Electric & Mfg. Co. has announced a price increase on all mechanical drive turbines, effective July 6. Details may be obtained from district offices.

# Bars

Bar Prices, Page 84

**Pittsburgh**—Shipments continue to exceed incoming business in hot-rolled bars. Some producers, however, entered July with a number of fair orders from the automotive industry, including some tonnage for 1938 models and the remainder to round out production of the 1937 series. Material for 1938 cars is barely a start on the expected requirements. Some cold finishers, certain forging shops, farm implement and machinery makers remain active. Miscellaneous consumers for the most part are ordering in close proportion to their actual requirements.

**Cleveland** — Decline in requirements for alloy and commercial carbon steel bars has been more pronounced than in some other steel products. This resulted from the sharp recession in specifications from auto partsmakers. Most miscellaneous consumers continue to resist the general seasonal influences better than expected. The outstanding example is the encouraging activity among tractor and other farm implement manufacturers. Most mills are able to make deliveries within three to four weeks, and in some instances sooner, depending on particular trade required.

**Chicago**—Resumption by Inland Steel Co. assures consumers of bars more nearly adequate supplies. The currently outstanding feature of the steel bar trade is activity of agricultural implement makers. Contrary to the usual program, the implement industry is showing no signs of a summer letdown. Somewhat similar is the continuation of the auto parts industry although there are signs that a reduction may come somewhat later. Tractor builders are working overtime but are far behind on deliveries.

**Boston**—Commercial steel bar buying has slowed materially. Alloy and forging bars, which have held relatively better than soft steel material, are also less active. Some consumers, having curtailed operations, feel present stocks are ample for needs for the next few weeks, especially in view of improved deliveries.

**New York**—Bar demand still lags, with increasing improvement in deliveries. Some mills, now resuming operations after suspensions due to labor troubles, are in position to offer fairly prompt delivery on many sizes; others can offer a good range

# Behind the Scenes with STEEL

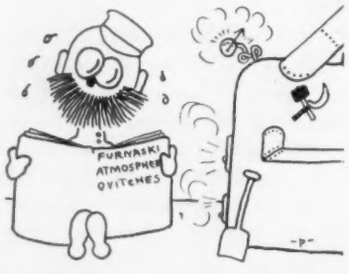
### Salt

WHAT WITH women and small children keeling over in the streets and strong men turning pale with the heat, this department has decided to follow the lead of other heavy industries and go in search of some salt tablets. Recent releases from a dozen sources have sung to the skies praises of these little harbingers of real relief. Our vice-president in charge of how to keep cool with your clothes on says he has investigated thoroughly and found out that the reason most cows are contented, even in hot weather, is because they have a nice big block of cooling salt to lick on. Looks to us like a new flood of propaganda on the part of the salt-makers. Last thing which gave the salt market a shot in the arm was the big goiter-prevention drive put on some years back. Must be the real McCoy, to coin a phrase, because insurance companies approve heartily. Saves them money, we're told.

* * *

### Hotsky

OUR good Russian friend, A. M. Samarin, whose address is B. Kaluschskaja 12 Apt. 31, Moscow, 49, U. S. S. R., wrote in to request a copy of A. J. Fisher's article on




furnace atmospheres. Of course we whisked out a copy straightway and even now it is probably being scanned by a censor in some country between here and there. But we're not worried, because Comrade Samarin will soon be reading one of the best treatises on furnace atmospheres yet written. Incidentally, we still have a few copies left for any gentil readers interested in the subject.

* * *

### Psyched

WANDERING about the grounds of the Great Lakes Expo, which is holding forth here in Cleveland again this summer, we happened into a booth operated by Fenn college where we found a number of tubular steel stools. Ably assisted onto one of these by an attractive attendant, we found ourself face to face with a board full of pushbuttons. Fascinated, we pushed button after button, which made strange noises and lit lights. Finally the attractive attendant handed us a little card, which informed us we should by all means take up the profession of business executive. We were somewhat taken aback, but the a. a. hastened to assure us that machines couldn't be wrong. Now we are composing an ad to insert in STEEL'S classified section. Doesn't somebody want a good business executive?

* * *

### Expedition

CHAMBER of Commerce of the State of Kansas has sent an expedition out around these United States to find out why more things aren't made in Kansas. Noble indeed is the purpose of this hardy band. We are sure they will find out plenty of reasons why more things aren't made in Kansas, and if they will only stop by at the offices of what used to be the Literary Digest, they'll probably find at least one thing that wasn't "made" in Kansas.

* * *

### Monk

MOST interesting character in this week's book is the silhouetted simian monkeying with the machinery on page 54. We feel the little devil is about to throw a wrench (monkey, of course) into the works. He has *such* an *evil* glint in his eye!

—SHRDLU

of specifications within three to four weeks.

**Philadelphia**—Merchant steel bar demand has fallen off further as shown by the improvement in deliveries, which may be had from leading producers within ten days to two weeks. Jobbers appear to be well stocked. Some fill-in buying is noted on the part of direct mill buyers, but this also has slackened. Forging shops continue at a high rate of operations and constitute one of the bright spots in current bar activity.

**Birmingham, Ala.**—Output of bars is booked at least for the first half of the third quarter or better, with delivery promised into the latter part of the quarter. New tonnage was slightly higher in June than May.

# Pipe

Pipe Prices, Page 85

**Pittsburgh**—Producers of tubular goods are active. Seamless oil country goods requirements are well maintained. Some gain has been noticed in boiler tubes recently. Humble Oil & Refining Co. is reported to have let the construction contract for 39 miles of 8-inch welded gas line from Harris county, Texas, to Baytown. Prices are steady.

**Cleveland**—Requirements for commercial standard steel pipe for industrial extension and repairs, while limited to relatively small individual lots has held up better than expected and aggregates considerable tonnage. Most mills are fairly well stocked and are able to make deliveries within two or three days. Only two large projects are pending, the Industrial Rayon Co.'s purification plant at Painesville, O., requiring about 400 tons and a water main project for Cleveland, involving close to 500 tons. Cast pipe demand continues dull with most foundries building up stocks.

**Chicago**—Makers of cast iron pipe are reporting the receipt of satisfactory volume of orders for small lots which make a good total.

**Boston**—Cast pipe buying is light and in small lots. Most municipalities have bought most requirements for this year. Merchant steel pipe buying is small, but steady with resellers' stocks well balanced as a rule. Wrought demand is sluggish.

**New York**—For Tallmans Island sewage plant, 1000 tons of cast pipe has been placed and a like tonnage for New York city yard stocks, will be awarded this week to the Burlington, N. J., foundry. Except for a moderate tonnage of steel and cast pipe for Queens, N. Y., July 22, inquiry is light. The latter tonnage will be bought by the contractor. Some open bids on recent cast pipe have been slightly lower, although there appears to be no wide-spread break in prices.

Merchant pipe business reflects further curtailment in building construction, and with warehouse stocks plentiful, resale prices are showing greater unsettlement. In few cases do they reflect the advance in mill prices last spring; rather, they are in closer relation with the mill prices of first quarter. Mills have little lap weld to offer under five to six weeks, due to oil company demands.

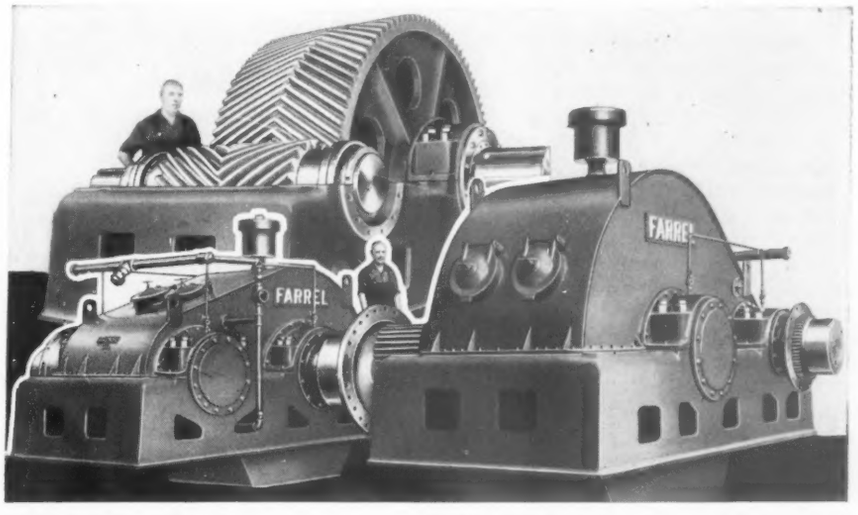
**Seattle**—The market shows no improvement. Some small lots are moving out of stock. Contract to build a water system for Ronan, Mont., has been awarded John O'Connor, Columbia Falls.

## Cast Pipe Pending

400 tons, 6, 8 and 12-inch for Portland, Oreg., bids in.

100 tons, 6 and 8-inch for Molalla, Oreg.; bids in.

Unstated, nine miles, for Phillipsburg, Mont.; bids in.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110 Main St., Ansonia, Conn. 322 Vulcan St., Buffalo, N. Y.

Unstated, 19,000 feet, 2 to 8-inch for Circle, Mont.; bids in.

## Steel Pipe Placed

595 tons, bureau of reclamation, specification 724, Calexico, Calif., to Southwest Welding & Mfg. Co., Inc., Alhambra, Calif.

# Transportation

Track Material Prices, Page 85

Railroad buying is reviving in moderate degree and considerable steel is involved in rail and rolling stock contracts.

Bids will be opened by the New York board of transportation July 27 on 100 subway cars, for operation on the Independent subway. New York Central opened bids July 9 on 10 coaches.

Third quarter steel requirements of eastern railroads are definitely lighter and, according to present indications, purchases will be confined to actual needs. Rumors are heard that one of the major roads is contemplating an additional expansion program but this has not reached the inquiry stage.

St. Louis Southwestern has placed 3000 tons of standard rails with Carnegie-Illinois Steel Corp., which also booked around 17,000 tons of rails and about 1000 tons of fastenings for export to Brazilian railways. St. Louis Southwestern also divided 1200 tons of rails between Inland Steel Co. and Tennessee Coal, Iron & Railroad Co.

Chicago, Milwaukee, St. Paul & Pacific railroad contemplates building 1000 seventy-ton steel frame gondola cars in its own shops.

Great Northern is reported considering the purchase of two diesel-electric locomotives. Chicago & North Western is inquiring for 50 caboose car underframes; Illinois Central is inquiring for 25 hopper cars; Minneapolis, St. Paul & S. S. Marie is inquiring for 100 box cars.

## Rail Orders Placed

Brazilian railways, 17,000 tons rails and 1000 tons track fastenings, to Carnegie-Illinois Steel Corp., Pittsburgh

St. Louis Southwestern, 3000 tons standard rails, to Carnegie-Illinois Steel Corp., Chicago.

## Car Orders Placed

Canadian National, 30 sand cars, to National Steel Car Corp., Hamilton, Ont.

## Car Orders Pending

Board of transportation, New York, 100 subway cars.

Boston Elevated Railways, Boston, 10 trolley coaches, contemplated.

Chicago, Minneapolis, St. Paul & Pacific, authorized by federal district court to buy 1000 gondolas at a cost of $2,562,000; also inquiring for 100 fifty-ton box cars.

Chicago & North Western, 50 caboose underframes.

Illinois Central is inquiring for 25 fifty-ton hopper cars.

Minneapolis, St. Paul & S. S. Marie, 100 box cars.

New York Central, six dining cars and four baggage and mail cars.

## Locomotives Pending

Great Northern, two 0-4-4-0 type diesel-electric locomotives.

Chicago, Minneapolis, St. Paul & Pacific, has been authorized to purchase one steam locomotive at a cost of $125,000.

Newburgh & South Shore, one or two locomotives, pending.

# Wire

Wire Prices, Page 85

**Pittsburgh** — With specifications for new automotive parts getting under way, manufacturers' wire is expected to gain strength this month. While the merchant trade has remained quiet, there have been signs of new ordering. Pressure for shipments is noticed in wire rods.

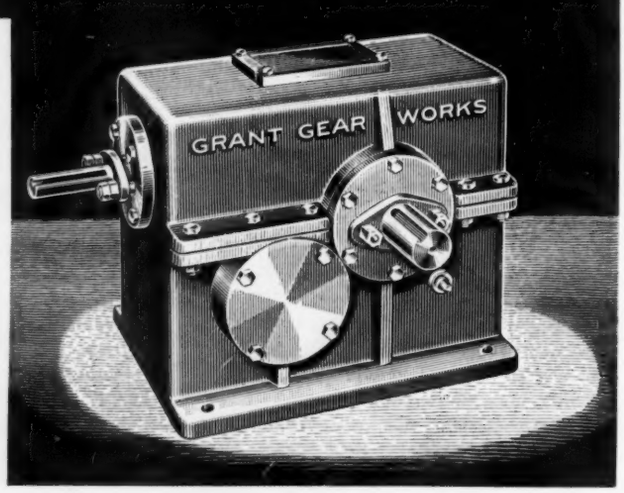
**Cleveland** — Specifications for manufacturing and merchant wire products have receded in about the same proportion as most other steel products. However, most mills continue the high operating schedules as in May and June, with the result that considerable headway has been made against backlogs with the corresponding easing of pressure for deliveries. Consumers generally are in no hurry to buy ahead despite the fact that shipments in most instances have gone directly into production.

**Chicago**—Incoming new business on wire and wire products is increasing. Especially is this true of manufacturers' wire, with consumers expanding requirements with the subsidence of the strike. Products such as nails, etc., are in steady demand, entirely seasonal.

**Boston**—Wire mill operations continue high, although incoming business is more spotty as to products. In volume current buying is about the same as in recent weeks. Manufacturers' wire still holds substantially well.

**Birmingham, Ala.**—Buying of wire products, including fencing and nails, has slackened, although resumption of buying, particularly from farm sources, is predicted within the next 35 to 40 days or as soon as better seasonal conditions set in for agriculture. Inquiries continue fairly steady.


GRANT SPEED REDUCERS

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GRANT GEAR WORKS Boston

# Shapes

Structural Shape Prices, Page 84

**New York**—Award of 2510 tons, New Jersey approach, Lincoln tunnel, New York, further reduces pending structural tonnage in this district, which includes 3500 tons for the Queens tunnel and 3200 tons for New York city schools. Seven of the latter recently bid, direct steel lettings involving 9929 tons, have been formally placed. New tonnage is coming out less freely. Additional contracts for the Bronx-Whitestone bridge, including 2000 tons for anchorages, will be out shortly.

Employes of structural shops in Northern New Jersey have made demands for wage increases ranging from 30 to 50 per cent.

**Boston**—Structural shops continue handicapped by labor troubles. Considerable small-tonnage business has been delayed while larger contracts have for some time gone mostly to Pennsylvania shops. More than a score of small bridges, mostly stringer spans, are active. Vermont has bridges out for bids taking 350 tons.

**Philadelphia**—Belmont Iron Works will re-open its Royersford fabricating plant shortly, idle for the past six years. American Bridge Co. will re-open its Trenton plant, closed for five years. These developments are indicative of the pending and anticipated structural shape jobs likely to be placed with eastern interests, with most fabricating shops booked ten to 12 weeks ahead. Considerable state and government work also is ahead but the Pennsylvania state grade elimination program for the year ended June 30, 1938, has been reduced considerably from that for the year just ended.

**Pittsburgh**—Awards are heavy. Approximately 8000 tons of sheet steel piling will be required for Mare Island navy yard, California.

**Cleveland**—Requirements for fabricated structural steel, while still limited in most instances to tonnages under 100 tons from private industrial sources, the aggregate this month is more than in the corresponding period of June. Most local fabricators are so heavily booked that they have been forced to reject some new business. State work has been particularly dull with little improvement expected through this month. Mill deliveries can usually be made within six weeks.

**Chicago**—More small structural jobs are coming out in the middle west, with few of importance. Strikes at St. Louis fabricating plants still are troublesome and operations have been reduced heavily. Note is made of 72 small inquiries now active totaling 3167 tons of structurals.

**St. Louis**—Highway work constitutes the principal hope of structural steel fabricators at the moment. The Oklahoma highway commission opened bids June 24 for projects calling for 1152 tons of shapes. It is expected that other states will shortly be in the market for highway betterments.

**San Francisco**—A fair tonnage of structural shapes were placed during the week, totaling 2983 tons and bringing the aggregate for the first half of the year 112,841 tons, compared with 103,708 tons for the same period a year ago.

**Seattle**—Proposed construction indicates less tonnage will be placed

## Shape Awards Compared

| | Tons |
|---|---|
| **Week ended July 10** | **13,900** |
| **Week ended July 3** | **34,782** |
| **Week ended June 26** | **59,641** |
| **This week, 1936** | **41,952** |
| **Weekly average, 1936** | **16,332** |
| **Weekly average, 1937** | **27,134** |
| **Weekly average, June** | **32,510** |
| **Total to date, 1936** | **624,650** |
| **Total to date, 1937** | **759,769** |

Includes awards of 100 tons or more.

## Unit Steel Bids, to Port of New York Authority

**New Jersey Approach, Hudson Boulevard East and Pleasant Avenue, Lincoln Tunnel, New York City to Weehawken, N. J., bids June 22, Contract MHT-23**

| Material | Unit | A | B | C | D | Lowest Total |
|---|---|---|---|---|---|---|
| Structural steel, carbon and copper-bearing; lbs. | 4,000,000 | $0.12 | $0.10 | $0.10 | $0.11 | $400,000 |
| Silicon steel; lbs. | 1,050,000 | 0.15 | 0.13 | 0.12 | 0.14 | 126,000 |
| Reinforcing rods: lbs. | 2,350,000 | 0.0775 | 0.08 | 0.075 | 0.06 | 141,000 |
| Reinforcing trusses; lin. ft. | 100,000 | 0.50 | 0.60 | 0.50 | 0.32 | 32,000 |
| Cast steel bearings and castings; lbs. | 75,000 | 0.30 | 0.50 | 0.26 | 0.224 | 16,800 |
| Steel conduits, pipe and ducts; lbs. | 30,000 | 0.43 | 0.20 | 0.60 | 0.20 | 6,000 |

A—George M. Brewster & Son, Inc., Bogota, N. J., low on general contract, $2.287,205; B—Underpinning & Foundation Co., New York, $2,291,020; C—Poirier & McLane Corp., New York, $2,312,755; D—Rusciano & Son Corp., New York, $2,341,901.


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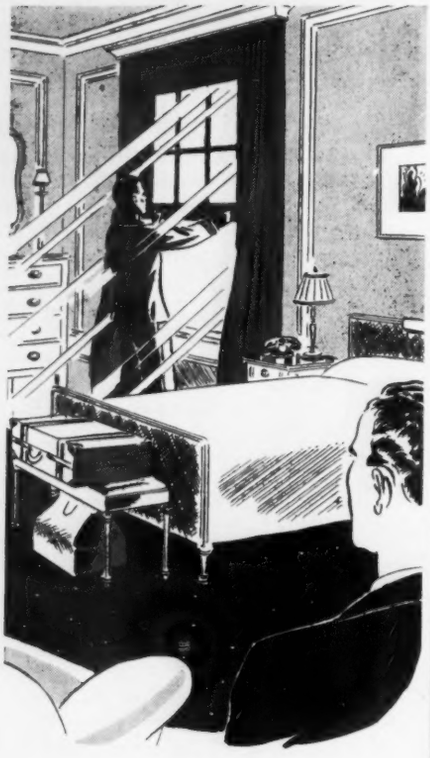

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**A TRAVELING SALESMAN**

. . . who thought all hotels were about alike. Then he came to Hotel Cleveland.

His red-cap took him from train to hotel in one minute. Convenient; time saved; taxi fare saved.

Everyone, from the very first person he met, seemed *glad to see him.*

He was whisked up to a really comfortable room—easy chairs, plenty of lamps, an inviting bed, a spacious desk, a gleaming bathroom with a heap of soft towels.

He went out and found himself in the very heart of Cleveland, next door to all the calls he wanted to make.

He came back to Hotel Cleveland... listened to a grand dance band . . . enjoyed the best dinner he'd had in years—and wound up a thoroughly pleasant day. He went to bed and sank down, down, down into rest.

And the moral of this story is—you might as well be comfortable and conveniently located, as you will be at

HOTEL CLEVELAND Cleveland

in the Pacific Northwest this quarter. Public works expenditures are restricted.

## Shape Contracts Placed

2510 tons, including 1900 tons, carbon and copper-bearing and 610 tons, silicoln steel, New Jersey approach, Lincoln tunnel, Weehawken, N. J., to American Bridge Co., Pittsburgh; George M. Brewster & Son Inc., Bogota, N. J., general contractor.

1100 tons, procurement division treasury department, New York, to Eggleston Bros., Long Island City, N. Y.

895 tons, Duplan Silk Mill, Grottoes, Va., to Virginia Bridge & Iron Co., Roanoke, Va.

835 tons, federal office building, Houston, Tex., to Mosher Steel & Machinery Co., Dallas, Tex.

835 tons, bridge, sec. 115F, Rock Island county, Illinois, to Clinton Bridge Works, Clinton, Iowa.

800 tons, state highway bridge, contract 1535, St. Leon, Ind., to Central States Bridge & Structural Co., Indianapolis, Ind.

610 tons, building, Seth Thomas Clock Co., Thomaston, Conn., to Lehigh Structural Steel Co., Allentown, Pa.

570 tons, hangar, Pan American Airways, Miami, Fla., to Ingalls Iron Works, Birmingham, Ala.

550 tons, nine steel oil barges for Tidewater Transportation Co., Attalia, Wash., to Bethlehem Steel Co., Seattle.

500 tons, alterations to Manhattan bridge, New York, for city of New York, to American Bridge Co., Pittsburgh.

500 tons, trash racks, etc., Coulee dam, to Arthur J. O'Leary & Son, Chicago.

500 tons, bulkhead, gates, frames, etc., Coulee dam, to American Bridge Co.

450 tons, state bridge No. 11.04, New York, New Haven & Hartford railroad, Braintree, Mass., to American Bridge Co., Pittsburgh.

400 tons, state bridge WPGH-101-A over Boston & Maine railroad, Kennebunk, Me., to American Bridge Co., Pittsburgh.

350 tons, gas plant, Wisconsin Gas & Electric Co., Racine, Wis., to Worden-Allen Co., Milwaukee, through United Gas Improvement Co., Philadelphia; also 100 tons of plates.

350 tons, transmission towers, Loup River Public Power & Irrigation district, Columbus, Nebr., to Lehigh Structural Steel Co., Allentown, Pa.

320 tons, gym addition, Rennsselaer Polytechnic Institute, Troy, N. Y., to Jones & Laughlin Steel Corp., Pittsburgh.

270 tons, Brewster housing project H-1201, U. S. government, Detroit, to Joseph T. Ryerson & Son Inc., Chicago.

250 tons, state bridge No. 88, Argyle, Wis., to Milwaukee Bridge Co., Milwaukee, Wis.

250 tons, building, American Coating Mills, Elkhart, Ind., to Elkhart Bridge & Iron Works, Elkhart, Ind.

250 tons, state bridge Flathead river, Mont., to unstated interest.

245 tons, grade crossing, route 3, over Susquehanna & Western railroad, Paterson, N. J., to American Bridge Co., Pittsburgh; J. P. Burns, Dumont, N. J., general contractor.

195 tons, building 632 extension, for Aluminum Co. of America, Alcoa, Tenn., to Fort Pitt Bridge Works, Pittsburgh.

150 tons, addition Arnold Constable store, New York, to DeVoe Iron Works, New York.

125 tons, bridge, Buchanan county, Missouri, to St. Joseph Structural Steel Co., St. Joseph, Mo.

110 tons, foundations cylinders, Power, W. Va., to Pittsburgh-DesMoines Steel Co., Pittsburgh.

## Shape Contracts Pending

8000 tons, sheet steel piling, for Mare Island navy yard, California.

2500 tons, piling, highway project, Beach Channel drive, Queens, N Y.; bids July 19.

1152 tons, highway bridges, Oklahoma; bids in, include Kingfisher county, 187 tons; Buchanan county, 235 tons; Okmulgee county, 120 tons and Garfield county, 300 tons.

1100 tons, postoffice garage, Chicago.

400 tons, building, Pennsylvania Telephone Co., Johnstown, Pa.

400 tons, reconstruction of Eighteenth street bridge, Chicago.

400 tons, loading dock, Ingleside, Tex.

400 tons, dam, Ogalalla, Nebr.

360 tons, school building, for Immaculate Conception church, Jamaica, N. Y.

350 tons, extension to warehouse, General Electric Co., Niles, O.

300 tons, miscellaneous material for No. 8 open-hearth furnace, Ford Motor Co., Dearborn, Mich.

300 tons, roof for service station, Tulsa City Lines Inc., Tulsa, Okla.

250 tons, fabricated structural steel, East avenue overpass, Erie, Pa., Constructors & Engineers Inc., Chicago, low at $250,333.88 on general contract.

250 tons, lead mill building, for American Smelting & Refining Co., Perth Amboy, N. J.

250 tons, furnace building, Libbey-Owens-Ford Glass Co., Ottawa, Ill.

250 tons, store, Arnold Constable, New Rochelle, N. Y.

230 tons, building, for Bakelite Corp., Bound Brook, N. J.

184 tons, state overpass, Glendive, Mont.; Lease & Leighland, Great Falls, low.

178 tons, state bridge, Sweet Grass county, Montana; James Crick, Spokane, Wash., low.

150 tons, addition shipping building, fertilizer works, TVA, Knoxville, Tenn.; bids July 21.

125 tons, rink, Cleveland Figure Skating Club, Cleveland; bids in.

115 tons, piling, spillway and culvert, Bridgetown, N. J.; bids July 13.

107 tons, Fisher Body Corp., train shed, Cleveland; bids in.

100 tons, various state highway projects; bids in at Olympia, Wash.

100 tons, bridge, Oakland, Me.; bids July 21.

## Cold-Finished

**Cold Finished Prices, Page 85**

**Pittsburgh** — New business has shown an upturn in cold-finished steel with receipt of some automotive tonnage for 1938 models for July and August delivery. This business developed slightly earlier than sellers had anticipated. However, only a start has been made and most of the buying will not materialize for some weeks. Manufacturers of textile and screw machines continue active. Prices are steady.

# Reinforcing

**Reinforcing Bar Prices, Page 85**

**Pittsburgh**—Recent awards have been well maintained, including 1500 tons for the Parkside housing project, Detroit, placed with Joseph T. Ryerson & Son Inc., Chicago. The Banksville road project in Pittsburgh will require approximately 1000 tons of material.

**Cleveland**—Estimated tonnage of reinforcing steel bars from private sources during June for northern Ohio was 2270 tons, compared with 385 tons in May and 526 tons for April. The improvement during June was due to the Industrial Rayon Co.'s project at Painesville, O., for which approximately 2000 tons of bars will be required. This is the largest reinforcing project in this locality for over 3½ years. Pending work is confined to small private jobs taking from 25 to 50 tons or under.

**Boston**—Awards total several hundred tons, mostly small bridge and highway projects. Inquiries are slower and few large projects are pending. Connecticut is expected out shortly for highways, taking considerable mesh. Prices continue unsteady.

**New York**—Reinforcing bar buying is smaller, although close to 8000 tons, mostly for sewers is still pending. Bids are in on most of this tonnage. Small-lot buying is active and contracts also include 1000 tons of highway mesh. Price weakness has cropped out on mesh and shading continues on large bar projects.

**Buffalo**—Strong third quarter demand is expected here and in the Canadian region just across the border. The Buffalo sewer authority has just awarded contracts for $939,400 of additional construction, largely concrete work, in connection with its local program. A $1,500,000 grain elevator is under construction at Hamilton and numerous smaller industrial projects have just reached contract stage.

**Philadelphia** — Reinforcing bar makers are figuring considerable work, but much of this is slow in coming out. A large part is of a private character for plant remodeling and expansion. Quotations are generally steady although concessions still are reported available on attractive lots.

**Birmingham**—Producers are operating at capacity in reinforcing, light structural and angles with numerous inquiries denoting at least a fairly early resumption of quantity specifications.

**Seattle**—Third quarter prospects are not promising as state and federal expenditures are being curtailed. Operations are reduced at local mills as backlogs are well in hand. Important new projects are lacking and general construction is being hampered by increased costs.

## Concrete Awards Compared

| | Tons |
|---|---|
| **Week ended July 10** | **7,083** |
| **Week ended July 3** | **9,722** |
| **Week ended June 26** | **11,133** |
| **This week, 1936** | **6,107** |
| **Weekly average, 1936** | **6,005** |
| **Weekly average, 1937** | **5,789** |
| **Weekly average, June** | **9,596** |
| **Total to date, 1936** | **194,210** |
| **Total to date, 1937** | **162,095** |

## Reinforcing Steel Awards

1500 tons, Parkside housing project, Detroit, to Joseph T. Ryerson & Son Inc., Chicago.

1260 tons, post office and court house, Waterloo, Iowa, to Truscon Steel Co., Youngstown, O.

750 tons, contracts No. 10 and No. 11, Central Nebraska power house and Irrigation district, Hastings, Nebr., to Sheffield Steel Corp., Kansas City, Mo., through Construction Products Co.

600 tons, state highway projects, Thurston county, Washington, to Northwest Steel Rolling Mills, Seattle.

487 tons, bureau of reclamation, No. 42689-A, Phoenix, Ariz., to Colorado Fuel & Iron Co., Denver, Colo.

300 tons, mesh highway project, RC3890, Patchogue Village, Suffolk county, New York, to Truscon Steel Co., Youngstown, O.; through Joseph Murray, Rochester, N. Y., general contractor.

275 tons, mesh highway project, RC3884, Broome county, New York, to Truscon Steel Co., Youngstown, O.; through J. F. Morgan Co., Ithaca, N. Y., general contractor.

225 tons, sludge disposal building, Buffalo sewer authority, Buffalo, to Buffalo Steel Co., Tonawanda, N. Y.

224 tons, Laurel Homes project, Cincinnati, to Pollak Steel Co., Cincinnati.

178 tons, bureau of reclamation, No. 27053-A, Fresno, Calif., to Northwest Steel Co., Seattle.

175 tons, reconstruction, chain bridge, Potomac river, Washington, D. C., to Hudson Supply & Equipment Co., Washington; Tuller Construction Co., Red Bank, N. J., general contractor.

160 tons, Eagan Chevrolet Camp building, St. Paul, to Paper Calmenson & Co., St. Paul, Minn.

150 tons, Hiram Walker building, Peoria, Ill., to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, wholesale market building, for Swift & Co., New York, to Bethlehem Steel Co., Bethlehem, Pa.

125 tons, U. S. veterans hospital, Hot Springs, S. Dak., to Sheffield Steel Corp., Kansas City, Mo.

113 tons, St. Vincent's hospital, Philadelphia, to American Steel Engineering Co., Philadelphia.

111 tons bureau of reclamation No. 27051-A, to Northwest Steel Rolling Mills, Seattle.

100 tons, bridges, Woodbridge, N. J., to Igoe Bros., Newark, N. J.; through

At a temperature of 110°F, the average worker has only 10% of his efficiency, as careful studies under factory conditions have proved. With Coppus Heat Killers (the only kind that direct the heat on the job, and that cannot recirculate stale air) — you make the worker 10 times as efficient. For a slight investment and small operating cost, you get as much more efficient work done as if you put 9 extra men on the job.

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Weldon Construction Co., Westfield, N. J.

100 tons, grade crossing, New York Central railroad, Syracuse, N. Y., to Truscon Steel Co., Youngstown, O.

100 tons, brewery Adam Scheidt Brewing Co., Philadelphia to Truscon Steel Co., Youngstown, O.

## Reinforcing Steel Pending

1000 tons Banksville road, Pittsburgh; Booth & Flynn Co., Pittsburgh, low bidder on general contract.

420 tons, sewer contract No. 2, Ditmars boulevard, Queens, N. Y.; bids in.

375 tons, plain steel bars, East avenue overpass, Erie, Pa.; Constructors & Engineers Inc., Chicago, low at $250,333.81 on general contract.

240 tons, sewer, avenue M, Brooklyn, N. Y.; bids July 16.

200 tons, highway bridge, Kingfisher county, Oklahoma.

155 tons, consisting of 105 tons fabricated steel bars and 50 tons plain steel bars, pony truss bridge, Centre county, Pennsylvania; bids to state highway department, Harrisburg, Pa., July 16.

150 tons, state highway projects, Washington; bids at Olympia July 20.

104 tons, for Rike-Kumler Co. store building, Dayton, O.; general contract to Frank Messer & Sons, Cincinnati.

Unstated, bureau of roads bridge Victor highway, Idaho; W. C. Burns, Idaho Falls, general contractor.

Unstated, bureau of roads, Gold Creek, Alaska, bridge; Mendenhall Construction Co., Juneau, Alaska, low.

This illustrates one of our larger perforations—slugs from the holes are about the size of twenty-five cent pieces. The comparison ends there, we are sorry to say, but it gives you some idea of how *large* we go.

Dots the size of our *small* perforations aren't easily seen—and that gives you some idea about that too.

We perforate almost any kind of metal, and our service is prompt.

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**171 York St., Rochester, N. Y.**


# Pig Iron

**Pig Iron Prices, Page 86**

**Pittsburgh**—Producers expect to build up stocks this month since spot demand continues light. Inventories at furnaces are low after the recent heavy shipments. Some consumers apparently are in no great hurry for material and a few foundries in the district have materially slackened operations for vacations and inventories. Foreign inquiry has dropped and only one small tonnage for Japan has been noted recently. Blast furnaces of steel producers who observed vacations in the last week of June and the first week of July maintained operations while other departments were idle.

**Cleveland**—Pig iron sellers report little change in general market conditions with most foundries content to buy for spot delivery and in no hurry to contract for third quarter. Activity has declined considerably over the last 30 days, particularly among auto foundries. However, those serving the agricultural trade have been exceptionally active, reflecting the good demand for farm equipment. Most sellers have cleared all second quarter tonnage. Prices continue firm, with some talk of an advance for fourth quarter but this is generally thought improbable.

**Chicago**—Incoming pig iron business indicates that July shipments will exceed those of June by perhaps 10 per cent. June deliveries were about 7 per cent below May. Consumers are carefully covering needs and forwarding specifications in such a satisfactory manner as to sustain the activities of four merchant blast furnaces in this district. Foundries are slightly increasing melt, both gray iron and malleable. Auto parts makers are enjoying sustained production, and miscellaneous consumers of pig iron unite to assure steadiness of the market and especially of consumption rates. The Youngstown Sheet & Tube Co. this week started its two former Iroquois stacks, banked since the strike began.

**Boston**—Pig iron buying is dull, estimated at about 1200 tons mostly in small lots. The larger consumers have substantial stocks, but are expected to be active purchasers next quarter. Foundry melt has declined. Exports from this port continue heavy.

**New York**—With many foundries closed during the past week and some expected to remain down over the current week, pig iron specifications are at as low a point as any time to date this year. Moreover, in addition to slump in domestic specifications, foreign demand has eased. Fewer inquiries are current and are generally small. Sellers expect improvement in the latter half not only because the inventory period will be over but because consumers' stocks likely will need replenishing.

**Buffalo**—New quarter has started out slowly and not likely to show much change soon. Merchants believe June shipments were larger than requirements of many consumers and the latter may be prepared to reduce inventories this month. A blast furnace which has been down for relining has been placed in operation restoring the active list here to 12 units, practically all the modern furnaces in the Buffalo area.

**Philadelphia**—A number of foundries were down for vacations last week but most were scheduled to resume this week. Melt has held up unusually well. Some fill-in business is reported at unchanged third quarter prices.

**Cincinnati**—The pig iron market is at the dullest point of the year. Sagging demand for castings is extended to machine tools. Stove foundries are on fair schedules, but some are in vacation idleness. Melters have not yet recovered from indirect effects of labor troubles in other districts.

**St. Louis**—Buying of pig iron is principally of small lots for spot shipment, but the aggregate represents a substantial tonnage. Many small foundries which failed to supply their entire needs earlier in the year, have been good buyers. There is some inquiry for fourth quarter, but such inquiry has not been impressive. While there has been some talk of possible higher prices for the final three months, consensus of opinion is that there will be no revision.

**Birmingham**—Despite the almost unprecedented operating rate of pig iron producers in the immediate district, buying at the moment is described as spotty. While stocks are

described as rather heavy and considerable has been carried over, there is indication of absorption of this surplus in third and fourth quarter buying.

**Toronto, Ont.**—While the summer holidays are affecting business in the Canadian pig iron market, sales are well above average for this season and the markets are recovering from last week's holiday. Demand for iron has returned to its former level of around 1700 tons per week and a number of melters have covered for third quarter delivery. Inquiries continue to appear for forward delivery. Imports are low, entirely from the United States. Prices are firm and unchanged.

# Scrap

Scrap Prices, Page 88

**Philadelphia** — Clearing of the strike picture and continued active operations apparently are reflected in a still stronger market for scrap in Eastern Pennsylvania. Some mills re-entered the market last week for fair tonnage to replenish depleted stock piles. No. 1 steel brought $18.50 for at least two points, an advance of 50 cents. No. 2 steel sold at $16.50, likewise up 50 cents. Reading Co. is reported to have sold 200 tons of No. 1 steel at $19 for delivery in this section. Blast furnace borings and turnings are stronger at $12 to $12.50 with business done at the top of the range.

The market is decidedly buoyant with dealers reluctant to take business even at currently quoted levels. According to opinion in the trade, the market will show an advance of at least $1 a ton within the next two or three weeks.

One 6800-ton scrap cargo moved out of this district for abroad late last week. It is understood this movement just about cleans up orders booked with foreign consumers. No new foreign inquiries of any importance are noted here but Japan may re-enter the market, it is said.

**Pittsburgh**—Scrap displayed unusual midsummer strength in this district last week, No. 1 heavy melting steel rising $1. Buyers were able to obtain only small lots at $19.50 late in the week.

There was evidence of much resistance on the part of mill buyers to the advancing market, but in most quarters a further rise was anticipated. A large tonnage of scrap rails was understood to have moved into mill consumption.

**Chicago**—A further advance has been made in steelmaking grades of scrap, based on brighter prospects following resumption of production by mills recently idle because of labor troubles. Buying by one or two large consumers seems imminent and this adds strength. Several other grades have also been advanced, including cast iron borings and rails for rolling.

**Boston**—While most steel-making grades have not reflected the strength developed in other districts, several other grades are slightly stronger, including heavy breakable cast, borings and turnings, forge fire scrap, specification pipe and skeleton. Domestic buying is light with exports active against orders at unchanged prices. Wharfage charge of 10 cents per gross ton, Portland Terminal Co. on tracks of that company, Portland, Me., has been eliminated on iron and steel scrap destined for export, putting that port on a parity with Boston.

**New York**—Although not fully reflecting the additional strength in some districts several grades of scrap are firmer, including No. 1


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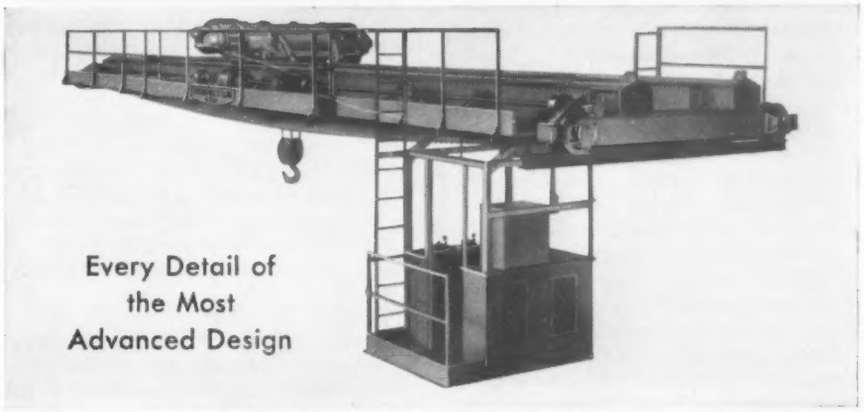

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heavy melting steel for domestic shipment, which is up 50 cents. Machinery and No. 2 cast for delivery at district foundries are also 50 cents higher. Buying for domestic consumption is slightly improved but still light. Purchasing for export on orders is brisk.

**Buffalo**—Demand for No. 1 heavy melting steel is increasing steadily and while dealers have made no tonnage sales they look for business soon. Dealers are confident recent weakness has been overcome and are holding material until they get prices in line with currently quoted lists.

**Detroit**—Further increase in most grades of steel scrap is reported by dealers here as sentiment grows increasingly strong. Borings, compressed sheets, loose clips, busheling, forge flashings, and heavy melting grades are up 50 cents; plate scrap up $1, and turnings up 75 cents. A sharp increase in buying is anticipated this month. With most automobile plants planning shutdowns of varying lengths during August for changeovers to new models, scrap supplies will be tighter.

**Cincinnati**—Prices for iron and steel scrap have been advanced here, on a general strengthening of the market. Heavy melting steel is bringing $15 to $15.50 from dealers, up 75 cents. Most other grades are up 50 cents. The advance was on a rather thin market, mills having accumulations.

**Washington**—Bids were received Thursday by the maritime commission on 28 vessels in the laid-up fleet. Thirteen bids were received, five for the account of foreigners whose individual tenders were high on 16 ships. The same ships were offered for sale in May for scrap but bids were rejected as unsatisfactory. At that time the highest bids for all ships was $350,050. The highest bids at this opening for all ships was $660,000. Bids tabulated on a per vessel basis totaled $1,021,135.97. Bids on the 16 vessels on which foreign bidders were high totaled $751,762.57.

**St. Louis**—There have been decided symptoms of strength in the scrap market. Quotations generally have been steady to firm, with advances of 25 to 50 cents per ton. Improvement in the labor situation in the Chicago area and further east has resulted in release of considerable tonnages of scrap here which were purchased by melters in the strike affected localities.

**Seattle**—Both export and domestic markets are weak. Japan is buying in only small tonnages, due to heavy supplies and difficulty of obtaining import permits. Domestic mills have ample supplies and are not interested. In the absence of trading, dealers refuse to name prices. Shippers in the interior are holding back and tidewater dealers are marking time.

**Toronto, Ont.**—Trading in iron and steel scrap has tapered slightly but dealers continue to find an active market for heavy melting steel and casting grades. Most other grades, except stove plate, are fairly plentiful and show fair movement. Automobile scrap is increasing in local yards and many dealers are holding supplies for delivery to the United States.

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## Warehouse

Warehouse Prices, Page 87

**Pittsburgh**—Although demand upon warehouses is lighter, jobbers expect activity will be fairly well maintained through the summer. Demand for sheets is holding, but most warehouses now are in a slightly better position from the standpoint of their stocks than six weeks ago.

**Cleveland**—Order volume and aggregate tonnage of some warehouse distributors has declined considerably over the last 30 days. This recession is apparent in practically all products except plates and structural shapes. An improvement in the latter item has been reported in some instances, due to the extended delivery situation. Some distributors do not expect any marked improvement through the month.

**Chicago**—June sales by warehouse were a trifle under those of May, as is expected in midsummer. Some shortage of sheets continues as mill shipments lag, but other products continue in good volume. Farm demand in the fall is relied on to bring larger sales.

**Philadelphia**—No unusual demand is reported for steel products out of warehouse. Total volume of new business continues to taper, although the aggregate number of orders shows little change. Prices are relatively steady.

**Cincinnati**—Warehouse business continues to resist seasonal dullness and, allowing for the holiday, sales are near the level held last month.

**St. Louis**—Warehouses have experienced little curtailment because of the season. Business continues on a large scale, with some unusually heavy tonnages being taken. Carlot shipments are reported on the increase, particularly to the west and southwest.

**Seattle**—Buying is spotty and confined to small lots. Sheets and light plates for tank and furnace jobs are in best demand, other items moving in irregular volume. Car buying is low but deliveries are improving. Prices are generally maintained.

## Ore Imports Heavy

**Philadelphia**—Heavy ore arrivals were noted here during the week ended July 3, four shipments totaling 18,706 tons. Of this, 8550 tons of chrome ore came from French Oceania and 1500 tons from South

Africa, 8250 tons of manganese ore from the Gold Coast, West Africa, and 406 tons of iron ore from Norway.

Twenty-one tons of pig iron came in from British India and 25 tons of structural shapes from Belgium.

## Steel In Europe

Foreign Steel Prices, Page 87

**London**—(*By Cable*)—The British government has reduced the duty on steel and iron imports to 2½ per cent on cartel imports under the quota, except wire products. On shipments in excess of the quota and on all rough or machined castings, stampings or pressings of seven pounds or over, other than gutters, domestic tanks, cisterns and on rough or machined forgings, it has been reduced to 12½ per cent.

Supplies of pig iron continue inadequate in spite of increasing production. All steelmakers are heavily booked ahead. American sheet bars are being imported to aid sheet mills.

A drive has been started by the British Iron and Steel federation for collection of all steel and iron scrap lying neglected in homes, factories and farms to aid in increasing the supply of raw material. Thousands of tons are expected to be retrieved in this way.

The Continent reports export demand subsiding because of long delivery delays.

## Semifinished

Semifinished Prices, Page 85

Production of semifinished steel in the Pittsburgh district was back to normal late last week after the interruptions by the holiday and vacation schedules. Demand continues well sustained, especially for sheet bars, skelp and wire rods, and mills have had little success in building up inventories because of the constant heavy requirements of finishing departments. Large export orders booked in the district in the latter part of May have further tightened the situation. Shipments against these bookings will begin soon. Requirements of nonintegrated consumers remain heavy.

## Tin Plate

Tin Plate Prices, Page 84

**Pittsburgh**—Extreme pressure for tin plate shipments continues here, due principally to the packers' can situation, where demand is heavier than in any recent season. Estimates of the pea pack, alone, indicate a large gain over last year. Some 21,000,000 to 23,000,000 cases may be packed, compared with 17,000,000 last year. Tin plate producers are striving to meet all the requests they possibly can. Operations were off last week, because of the holiday, but mills which have been operating 18 turns expect to return to that schedule in the current week.

**New York**—Tin plate specifications continue heavy. Foreign inquiry over the past week included three, one each from England, Sweden and Australia, with the latter having just been placed with Welsh mills for delivery in January, February and March of next year. It is reliably reported that the Welsh mills quoted 3 per cent under $5.35, Pittsburgh equivalent, which is the going market here on both domestic and foreign orders, and that the Welsh mills were further assisted by the tariff differential which applies among the British dominions. The other two inquiries were for delivery as soon as possible, but it appears that American sellers have little to offer much before November and December.

## Coke By-Products

Coke By-Product Prices, Page 85

**New York**—Phenol prices for second half have been reaffirmed at 14.75c a pound, 200-pound drums, Frankford, Pa., and St. Louis, and 14.00c, 400-pound drums. While demand has declined slightly, current production is well absorbed by shipments, which remain substantial to the chemical trade. Distillates are steady and in good demand with no accumulation of material. Naphthalene and sulphate of ammonia are seasonally dull.

## Metallurgical Coke

Coke Prices, Page 85

Connellsville low sulphur furnace coke generally is holding at around $4.50 and better per net ton. Although distress coke was offered in June as low as $4.25 a ton, this has been well cleaned up, and has not been construed as a true criterion of the price level. Spot demand continues light with shipments against contracts well maintained, considering all circumstances. Deliveries were resumed Friday to one furnace which has been repaired and will start July 15. Estimated production of beehive for the season up to the week ended June 26, according to the bureau of mines, was 1,792,800 net tons, compared to 651,900 in the corresponding period of 1936 and 3,306,600 tons in the 1929 period.

Trotter and Davidson mines of Republic Steel Corp. will remain closed until protection by local authorities is afforded employes who want to work, according to an announcement last week. An unsuccessful attempt was made to resume operations recently.

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# Iron Ore

Iron Ore Prices, Page 88

**New York**—Based on higher offerings both here and abroad, the nominal market of manganese ore has again been marked up—this time to around 52 to 53 cents, ex-duty, for 50 to 52 per cent material. Little if any tonnage has been purchased at these higher levels so far as can be learned, however.

Indicative of the higher trend are recent quotations of 52 and 53 cents, ex-duty, to a company desiring to obtain a tonnage because of delay in his own shipments. Also, there is a recent quotation of 51 cents quoted on a cargo in Montreal; and this, in the opinion of some trade leaders here, was a distress cargo. It is assumed that the boat expecting some delay at an American port in unloading and having to pick up a return cargo at Montreal tried to dispose of this ore at a sacrifice there. But even this price of 51 cents is higher than certain recent appraisals of the market.

Generally speaking, however, there are few firm offers for nearby delivery; nor at the moment for future delivery; and those that are made are contingent on the cost of ocean freight, which makes for an uncertainty which causes buyers to hesitate in placing orders. Moreover, in addition to this question of freight rates, there is also uncertainty as to time of delivery. Hence, all and all, there is little actual trading on which to establish a market.

Latest offerings in tungsten ore range $22 to $23 duty paid, for November-December delivery from China, little changed from a week ago; spot prices are purely nominal as no nearby supplies are availble.

# Nonferrous Metals

Nonferrous Metal Prices, Page 86

**New York**—A sudden spurt in activity on the London Metal Exchange early last week, culminating in peak prices on Wednesday, featured nonferrous metal market developments. With the exception of tin, which fluctuated, domestic prices held unchanged although zinc was strong at the close.

**Copper**—Export copper advanced to a high of 14.50c, c.i.f. European ports, before easing to around 14.05c by the close of the week. Buying in both the foreign and domestic markets tapered as prices eased abroad. Electrolytic held firm at 14.00c, Connecticut.

**Lead**—With June lead shipments estimated at 43,500 tons, or in excess of production, the price tone continued firm at 5.85c, East St. Louis. Inquiry for metal maintained a steady pace.

**Zinc**—Prime western closed strong at 6.75c, East St. Louis, with some interests anticipating an early advance. The June report showed an increase of only about 300 tons in stocks, indicating that supplies will continue tight for some time.

**Tin**—Straits spot closed at 59.25c compared with a high for the week of 60.12½c and the previous week's close of around 57.37½c. Demand was not heavy.

**Antimony** — Held unchanged and quiet at 14.12½c, New York.

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MERCHANT PIG IRON DIVISION OF NATIONAL STEEL CORPORATION

Buffalo Detroit New York Philadelphia Boston


# Institute Opposes Rise In Scrap Freight Rate

Institute of Scrap Iron and Steel Inc., New York, has filed a brief with the interstate commerce commission opposing a proposed 10 per cent increase in rates on steel and iron scrap. The claim is made that scrap is of less value than pig iron and moves in the same class of equipment yet rates are higher than on pig iron.

It is pointed out that prices of scrap fluctuate widely in response to demand and supply and while its price was high at the time the hearing was opened in March this was a temporary condition which no longer exists. With lessened demand the price declines and movement becomes much less.

# Tunnels Under River To Open New Coal Reserves

The driving of two 10-foot passages under the Monongahela river near the Ronco shaft of H. C. Frick Coke Co. will start soon. Completion of the tunnels will enable the coke company to open its reserves in the Green county side, using the Ronco shaft and river loading facilities which are on the Fayette county side of the river.

Since the state of Pennsylvania owns the coal under the river, the company had to obtain a permit for the tunnels and agree to pay a small royalty for the coal under the Monogahela.

In Green county it is estimated the Frick company holds approximately 70,000 acres in coal reserves. How much of this will be tapped by the new shafts from the Ronco mine is undetermined.

Preliminary work for the two new tunnels already has been completed.

# Most of Mechanization Profit Goes to Labor

From 1929 to April of this year manufacturing output per man-hour had increased 27.6 per cent, due largely to mechanization and efficient operation, and labor cost per man-hour had increased 17.7 per cent, according to an analysis by the National Industrial Conference board. While the labor cost per unit of product was 7.5 per cent lower, the labor cost per $100 of product was practically the same as in 1929 because of the lower level of wholesale prices of finished products.

The board's indexes for April,

1937, compared with the average for 1936 show an increase of 10.7 per cent in labor cost per man-hour and 7.7 per cent per unit of product, with a relatively slight increase in labor cost per $100 of output.

## Most Manganese Ore Needs Filled by Imports

Enlarged domestic demand for manganese ore in 1936 was met largely by increased imports, which were 121 per cent greater than in 1935, according to the bureau of mines. Domestic production was 22 per cent larger than in 1935. Shipments of manganese ore, 35 per cent or more manganese, from domestic mines in 1936 were 32,119 gross tons averaging 45 per cent manganese, compared with 26,428 tons averaging 44 per cent manganese in 1935.

Manganese ore was shipped from Alabama, Arkansas, Georgia, Montana, Tennessee, Utah, Virginia and West Virginia in 1936. Montana supplied 51 per cent of domestic production.

Ferruginous manganese ore, 10 to 35 per cent manganese, from domestic mines was shipped to the extent of 98,962 gross tons, averaging 15 per cent manganese. Manganiferous iron ore, 5 to 10 per cent manganese, from domestic mines totaled 841,557 gross tons, averaging 7.9 per cent manganese, compared with 430,893 tons in 1935. Practically all this ore was mined in Minnesota.

Imports of manganese ore totaled 846,648 gross tons, containing 415,749 tons of manganese, compared with 383,502 tons, containing 189,258 tons of manganese in 1935. Of the 1936 imports 34 per cent was from Soviet Russia, 29 per cent from Africa, 15 per cent from India and 13 per cent from Brazil. For the fourth consecutive year stocks of manganese ore in bonded warehouses declined and at the end of 1936 were 366,381 gross tons, the lowest reported since 1929.

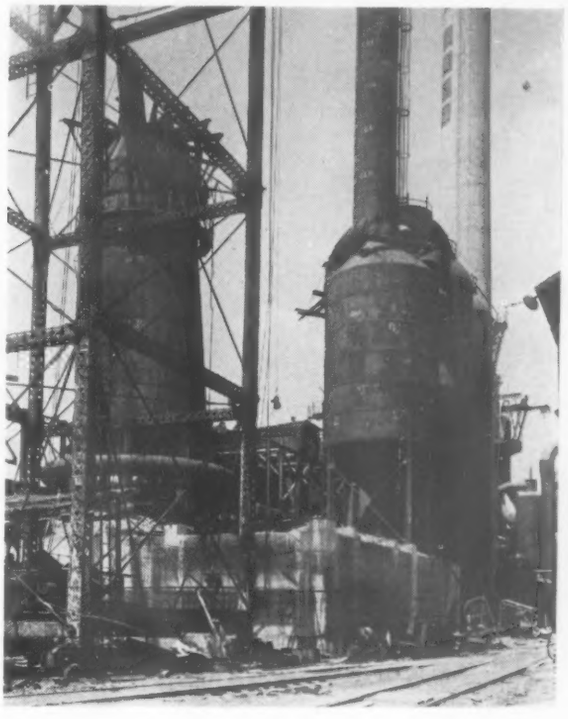
## Wage-Hour Legislation Futile, Says Economist

"There can be no increase in the number of slices from a pie, as well as in the size of each slice, unless the pie itself is made larger . . . . Total wage disbursements of manufacturers are determined by natural forces beyond control and cannot be enlarged by fiat."

These statements sum up the conclusions in a study of government effort to regulate wages and hours of labor, by Farrel-Birmingham Co. Inc., Ansonia, Conn. It is one of a series on economic subjects prepared by Allen W. Rucker in collaboration with N. W. Pickering, president of the company.

The statement is made that since 1920 disbursements for manufacturing wages have not exceeded total farm income, regardless of all government and union efforts to raise wage rates. The conclusion is reached that the Black-Connery bill, attempting to increase income by raising minimum wage rates will have one of two destructive results: Scaling down of wage differentials, serving to make the minimum also the maximum; further shrinkage of employment both in man-hours and number of workers.

## New Hamilton Blast Furnace Nears Completion



*THIS new million-dollar blast furnace will be ready for operation at the Hamilton Coke & Iron Co. plant near Hamilton, O., early in August. It will have a capacity of more than 450 tons daily and will supply molten pig iron to the parent American Rolling Mill Co.'s open hearths*

Net income of Continental Can Co. Inc., New York, after all charges, for twelve months ended April 30, amounted to $9,084,927. This is equivalent to $3.18 per share on 2,853,971 shares outstanding April 30.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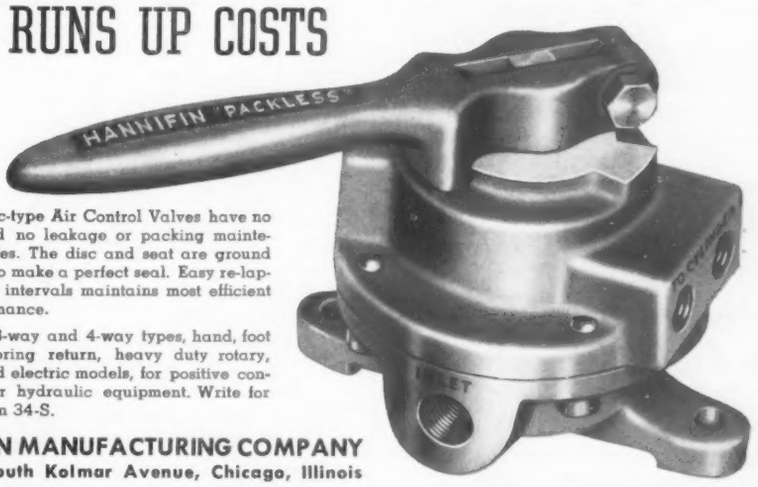


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## Coal Board Is Elected By Pennsylvania Operators

Coal operators of nine western Pennsylvania counties have elected a bituminous coal board of 14 members for District 2 under the Guffey-Vinson coal control act. The members are: H. E. Booth, Pittsburgh Coal Co.; R. E. Jamison, Jamison Coal & Coke Co.; George H. Love, Union Collieries Co.; A. R. Budd, Hillman Coal & Coke Co.; E. B. Leisenring, Westmoreland Coal Co.; E. W. Bratton, W. J. Rainey Co. Inc.; J. T. M. Stoneroad, Carnegie Coal Co.; H. L. Findlay, Y. & O. Coal Co.; F. T. West, Butler Consolidated Coal Co.; H. M. Wassum, Henderson Coal Co.; J. B. Moore, Fancy Hill Coal Co.; and T. J. Ward, O. E. Everly, and R. R. Bowie representing the "truck" mines.

## Welding Course Attended By Twenty-Three Professors

The increasing emphasis being placed on welding as a primary process of construction and manufacture was indicated by attendance at a special professors' course in arc welding sponsored recently in Cleveland by the Lincoln Electric Co. Twenty-three professors from 21 colleges participated in a five-day study of electric welding in both its theoretical and practical aspects. E. W. P. Smith, nationally known welding authority, was in charge.

## Simplified Practice for Steel Barrels Reaffirmed

Simplified practice recommendation for steel barrels and drums again has been reaffirmed without change, the national bureau of standards has announced. Proposed and developed by the industry, the recommendation was promulgated originally Jan. 1, 1925, revised Jan. 1, 1928, reaffirmed without change since. Copies may be obtained from government printing office, Washington, for 5 cents each.

## Unusual Activity Shown In Railroad Equipment

As of June 1 this year class I railroads had 45,176 new freight cars on order, more than on any corresponding date since 1924, according to the Association of American Railroads.

Also the class I roads had 329 new steam locomotives on order on June 1, this year, the largest number for any corresponding period since 1930, at which time 431 were on order.

New freight cars put in service during the first five months of this year totaled 27,807, the greatest number in any corresponding period since 1930, when there were 42,122.

New steam locomotives put in service in the first five months of this year totaled 122, compared with nine in the same period of last year and 20 in the corresponding period two years ago.

## Maximum Age Limit for Employment Not General

Less than 25 per cent of industrial companies have fixed maximum age limits on hiring workers, according to a survey by the National Industrial Conference board.

Of 405 concerns only 18, or 4.4 per cent, have a definite policy not to hire male wage earners over 40 years of age. Twenty-two companies, or 5.4 per cent, have established 45 as maximum age; 33, or 8.1 per cent, have established 50; 16, or 4 per cent, have established 60; three employ new workers up to 65 years of age.

All other factors being equal, younger applicants probably are favored, the board says.

## Traffic Report Issued

A report entitled "Functions of the Traffic Manager," has been issued by Metropolitan Life Insurance Co., New York, in which a number of companies in various industries are cited for their work in efficient and economical transportation of their products and purchased materials.

## Mirrors of Motordom

(*Concluded from Page* 36)

that the UAW movement is crumbling. Dues payments are becoming lax in many locals and sober judgment of more mature workmen is dampening the enthusiasm of some of the rabid young UAW members. In fact, this siege of labor trouble in automobile plants ultimately will react most favorably for the older employes who have demonstrated to their employers the value of experience and sound judgment in a workman. The older men have always been the last to quit their machines and join a sitdown or parade. And then have done so only because it is human nature to avoid bucking a majority, and to try to stay on what appears to be the winning side.

CONSTRUCTION of an eastern service plant for the Inland Mfg. division of General Motors in Clark township, south of Cranford, N. J., will be started within the next few weeks. Products will include steering wheels, running boards, motor mountings and rubber and metal parts for automotive, refrigeration and radio use.

The plant will provide about 100,000 square feet of floor space, will employ 200-300, and will be in operation about Nov. 1. The new project will be the sixth manufacturing unit of GM in New Jersey, and will be operated as a branch of the Inland division in Dayton, O.

Pontiac division of GM is adding nearly 60,000 square feet of floor space, including a school for plant apprentices, a foundry addition for core storage, and a separate plant administration building housing executive conference and dining rooms.

General Motors Truck has announced a new two-wheel "trailabout," commercial or utility trailer of 1000 pounds capacity which hitches either to passenger cars or trucks. Two all-steel body lengths—77 or 91 inches—and four body arrangements are offered.

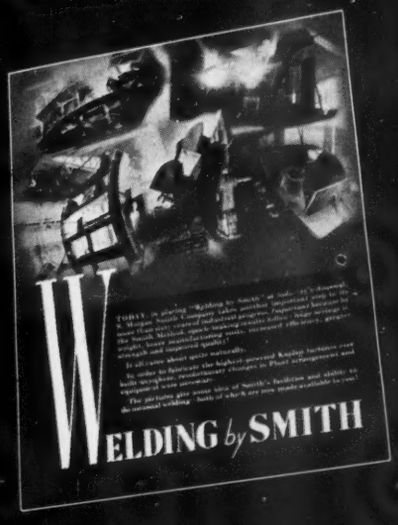
Hudson shipped more cars in June than in the same month for any year of the past seven, the total being 16,700 Hudsons and Terraplanes . . . Pontiac plant officials state they could produce cars at the present rate of over 200,000 per year for five years and never turn out two cars exactly alike. Reason: Two types of chassis; 15 types of bodies; seven colors; two styles of trim; four makes of tires; two types of radiators; two types of air cleaners; three rear axle gear ratios and ten different accessories . . . Fruehauf Trailer temporarily has shelved plans for an extensive new plant at Center Line near Detroit and will continue operations for the present in its plant on Harper avenue, making some additions to equipment.

# Equipment

**Pittsburgh**—Activity continues favorable in machine tools and other equipment, although not at the high peak experienced earlier this year. The customary seasonal letdown in demand for small tools is not as great, according to some dealers, as might have been expected. Westinghouse Electric & Mfg. Co. has announced a price increase on all mechanical drive turbines.

**Seattle**—Dealers anticipate less demand during the remainder of the year. Highway requirements have been generally filled and logging, lumbering and mining plan no immediate expansion, although mid-season replacements will furnish some business. Construction of many rural power lines is stimulating demand for certain equipment.

# HEAVY WELDING by

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# Construction and Enterprise

## Ohio

AKRON, O. — Taylor Young Airplane Co., Alliance, O., plans to build an airplane factory near the Akron airport. Estimated cost is $100,000.

BLUFFTON, O.—Central Ohio Light & Power Co., Arch Robinson, vice president-general manager, Findlay, O., will take bids around July 15 for construction of a 10,000-kilowatt steam generating power plant, estimated to cost over $100,000. Engineer is Sargent & Lundy, 140 South Deaborn street, Chicago.

CINCINNATI—Chevrolet Motor Co., 3044 West Grand boulevard, Detroit, plans to extend and improve its power plant at branch factory at 4726 Smith road, Norwood, Cincinnati. Cost will be about $200,000.

CLEVELAND—E. W. Ferry Screw Products Inc. has been incorporated by Thomas M. Kennedy, William Gordon and Paul H. Torbet. Thomas M. Kennedy, Guarantee Title building, is correspondent.

CLEVELAND—M & W Tool Co. has been incorporated by J. A. Mirl, J. B. Wadhams and G. Kraigmont. J. B. Wadhams, 1545 East Fifty-fifth street, is correspondent.

CLEVELAND—Southwell-Cawley Sheet Metal Co. was organized recently by Fred H. Southwell, Louis H. Wieber and M. A. Klein. Reasner & Wieber, Terminal Tower building, are correspondents.

FOREST, O.—Village is considering construction of water softening and iron removal plant costing about $21,500. Engineers are Champe, Finkbeiner & Associates, 1025 Nicholas building, Toledo, O.

LIMA, O. — Republic Creosoting Co., 1615 Merchants Bank building, Indianapolis, plans construction of a branch plant costing approximately $100,000.

LOGAN, O. — City plans to build an iron removal plant at waterworks, costing $20,000. Burgess & Niple, 568 East Broad street, Columbus, are engineers.

NELSONVILLE, O.—City plans to improve light plant and waterworks, and install the following new equipment: three modern 300-horsepower stoker-feed boilers, a water softening unit, four deep well electric turbine pumps, and an engine and generator unit. Cost will be around $80,000. S. G. Holland is mayor, and engineer is B. M. Coakley, Nelsonville.

TOLEDO, O. — Libbey Glass Co., Ash street and Wheeling & Lake Erie railroad, plans to build an addition costing $500,000. Forester, Wernert & Taylor, Nicholas building, are engineers.

WARREN, O. — City will take bids soon for construction of a water softening plant costing $90,000. Hoover & Montgomery, 8 East Long street, Columbus, are engineers.

WARREN, O. — Public Service Co., Hanna building, Cleveland, will take bids in August for construction of a generating plant costing $2,500,000. G. E. Snider, Hanna building, Cleveland, is engineer.

WEST ALEXANDRIA, O. — Village plans construction of sewage disposal plant costing $89,000, of which WPA will furnish $75,000, contingent upon approval by voters of $25,000 bond issue at special election soon. Ed. Rinck is mayor, and J. A. Craven, 212 Central avenue, Dayton, is engineer.

WOODSFIELD, O.—Village plans construction of sewage disposal plant costing $82,000. Eugene Smith is mayor and Jennings & Lawrence, 538 Rowlands building, Columbus, are engineers.

## Connecticut

NEW BRITAIN, CONN. — Landers, Frary & Clark, 47 Center street, plan to build a plant addition costing $40,000. W. F. Brooks, Lewis and Gold street, Hartford, are architects.

## Massachusetts

SAUGUS, MASS. — Eastern Tool & Die Stamping Co., 39 Ballard street, will ask bids soon for construction of a 2-story factory costing $40,000 with equipment. The old building will be razed. Architect is H. French, 210 South street, Boston.

## Rhode Island

PROVIDENCE, R. I. — Narragansett Electric Co., 49 Westminster street, plans construction of new steam-electric generating plant to cost about $2,000,000. Turbo-generator units and accessories, high-pressure boilers, pumps, etc., will be installed. United Engineers & Constructors Inc., 1401 Arch street, Philadelphia, are engineers.

## New York

CORNING, N. Y. — Corning Glass Works plans construction of a 4-story plant addition on East Tioga avenue. Cost will be over $300,000. A. Houghton is president.

KINGSTON, N. Y.—Artisan Mfg. Co. has been incorporated to conduct a machine shop, and N. J. Fowler, 293 Wall street, New York, is correspondent.

LONG ISLAND CITY, N. Y.—J. C. Machine Works, recently organized, has leased a one-story building at 2905 Fortieth road, to manufacture machinery and parts.

NIAGARA FALLS, N. Y. — Niagara Falls Power Co., Electric building, Buffalo, will take bids soon for construction of a 100 x 174-foot engine house costing $40,000.

TONAWANDA, N. Y. — General Plastic Co. Inc. plans to build an addition costing $150,000.

## Pennsylvania

NEWCASTLE, PA.—Pennsylvania Power Co., subsidiary of Commonwealth and Southern Corp., Lansing, Mich., is considering construction of a generating plant of 35,000-kilowatt capacity.

## Michigan

ADRIAN, MICH.—Southeastern Michigan Rural Electric Co-operative Inc., 409 National Bank building, is taking bids due 10 a. m. July 15 for erection of rural lines estimated to cost $250,000. Engineer is Roy A. White, 74 East Adrian street, Blissfield, Mich.

ALBION, MICH.—Union Steel Products Co. plans to build an addition to its plant, for which Perry T. Sharp, Albion, has general contract.

DETROIT — Lincoln Motor Co. will erect two conveyor bridges, two substations and a compressor foundation at its plant on West Warren avenue.

DETROIT — Universal Products Co. Inc., Dearborn, plans construction of an addition to its plant, for which Gallagher Construction Co., 2136 Conner street, has general contract.

RIVERVIEW, MICH. — Firestone Steel Products Co., care of Russell Engineering Co., 607 Shelby street, Detroit, plans to build a 1- and 2-story plant costing over $40,000.

SAGINAW, MICH.—Saginaw Malleable Iron division of General Motors Corp., David O. Thomas, general manager, plans construction of a new building, 100 x 520 feet, as an addition to the finishing department. Austin Co., 429 Curtis building, Detroit, has general contract.

SOUTH LYON, MICH.—City is taking bids July 19 for construction of a sewage treatment plant costing $45,000. Engineer is Hayden & Kunze, 705 Lawyers building, Detroit.

STAMBAUGH, MICH. — Council and city manager Charles A. Nelson are considering construction of a municipal power plant and estimates of cost are being made. A special election will probably be held in the fall to pass on bond issue. Probable engineer is Federal Engineering Co., Central Office building, Davenport, Iowa.

## Illinois

AURORA, ILL.—National Brush Co., Illinois avenue, plans to build an addition, 70 x 200 feet, and will install equipment. Bids will be taken soon for extension of the steam powerhouse. Total cost will be over $80,000. Frank B. Gray, 73 South LaSalle street, Chicago, is architect.

BELLEVILLE, ILL. — Coal Carbonizing Co., M. Donovan Curran, president, Bank of Commerce building, St. Louis, is considering construction of a coking plant costing $600,000.

CHICAGO—Kropp Forge Co., 5301 Roosevelt road, will add a 15,000-square foot building to house added machine shop facilities.

CHICAGO — Union Special Machine Co., 400 North Franklin street, is taking bids for construction of a 3-story, 105 x 110-foot plant at Kinzie and Orleans streets. Architect is I. Viehe-Naess, 5809 North Ridge avenue.

EAST ST. LOUIS, ILL.—Key Co., 2700 McCasland avenue, plans construction of a $500,000 foundry addition, for which the contract has been awarded to Fruin-Colnon Co., 5601 Oakland avenue, St. Louis. L. E. Everett is foundry superintendent.

LA GRANGE, ILL. — Electro-Motive Corp., subsidiary of General Motors Corp., General Motors building, Detroit, plans construction of 1-story, 360 x 816-foot addition to large diesel engine manufacturing plant, and will install electric power equipment. H. L. Hamilton is president.

ROCKFORD, ILL. — Sundstrand Machine Tool Co. will ask bids soon for construction of a 3-story, 120 x 128-foot plant addition costing $180,000. Architects are Peterson & Johnson, Rockford.

## Indiana

ANDERSON, IND.—Delco-Remy division of General Motors Corp. plans to

*(Please turn to Page 108)*

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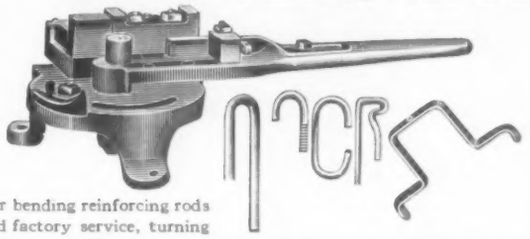

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(*Concluded from Page* 106)

build a 1 and 2-story addition and to install electric power equipment. Cost will be over $200,000, and work will begin soon.

### Alabama

HUNTSVILLE, ALA.—Southern Metal Products Corp. plans construction of three new 1-story additions to stove and range manufacturing plant, 20 x 200 feet, 30 x 120 feet, and 60 x 100 feet. Total cost will be about $100,000.

### District of Columbia

WASHINGTON — Bureau of yards and docks, navy department, takes bids until July 14 for diesel engine electric generating equipment and crane dredge to be installed on pontoon at navy yard, Pearl Harbor, T. H., specification 8491.

### Florida

TAMPA, FLA.—American Can Co., 230 Park avenue, New York, will begin soon on new $200,000 plant addition at First avenue and Twenty-second street. C. G. Preis is company engineer.

### Georgia

THOMASVILLE, GA.—City is considering installation of 3500-kilowatt turbine at water and light plant. Estimated cost is $80,000. D. R. Pringle is superintendent of light plant.

### North Carolina

CHARLOTTE, N. C.—C. & K. Operating Service Inc., 614A South Tyron street, has purchased site of Hastings Auto Service Co. and plans remodeling for modern autobody repair plant. Cost $100,000 with equipment.

OCRACOKE, N. C.—Ocracoke Power & Light Co. plans 14 miles of transmission lines and erection of generating plant. Total cost $40,000.

ROCKY MOUNT, N. C.—City will vote July 27 on $500,000 bonds for improvements to power and water plants.

STATESVILLE, N. C.—Duke Power Co., 430 South Church street, Charlotte, N. C., will construct rural electric line for northern Iredell county, at a cost of $50,000.

WILMINGTON, N. C. — Ethyl-Dow Chemical Co., Kure Beach, Wilmington, plans installation of motors and controls, electric operated pumping machinery, conveyors and other equipment in connection with expansion and improvements in local plant. Estimated cost $1,000,000. Company is affiliate of Dow Chemical Co., Midland, Mich.

### Louisiana

NEW ORLEANS — New Orleans Public Service Inc. has taken out permit for expansion and improvements in steam-electric generating plant on Market street, with installation of 37,500-kilovolt turbine generating unit and accessory equipment, high pressure boilers and complete auxiliary equipment. Project is part of $2,800,000 expansion and improvement program to be carried out in 1937.

NORCO, LA.—Shell Petroleum Corp., J. C. Munro, resident vice president, Canal Bank building, New Orleans, plans construction of a $750,000 plant addition.

SPRING HILL, LA.—Southern Kraft Corp., 220 East Forty-second street, New York, subsidiary of International Paper Co., plans to build a new branch mill about 50 miles from Shreveport, La. Total cost including installation of equipment will be close to $6,000,000.

SPRING HILL, LA. — Southern Kraft Corp., 220 East Forty-second street, New York, plans installation of motors and controls, transformers, regulators, electric hoists, loaders, conveyors and other equipment in new pulp and paper mill here. A power plant will be built and pumping station installed. Cost close to $6,000,000.

### Tennessee

ALCOA, TENN. — Aluminum Co. of America plans expansion program costing $15,000,000.

### Virginia

NARROWS, VA. — American Cellulose & Chemical Mfg. Co. Ltd., 180 Madison avenue, New York, plans to build a plant on a 1280-acre site recently acquired. First unit will cost about $6,000,000.

### Missouri

ROCKPORT, MO.—City plans construction of a municipal power plant and council has approved $90,000 bond issue. Work will begin soon. Engineering Service Co., Railway Exchange building, Kansas City, is engineer.

SHEFFIELD, MO. — Sheffield Steel Corp. plans additions and improvements to its plant. Estimated cost is $2,000,000.

### Oklahoma

TULSA, OKLA.—Wheatley Bros., pump and valve manufacturers, plan expansion of their plant on site recently acquired. Frank Wheatley is president.

### Texas

PECOS, TEX.—Red Bluff Water Power district, E. B. Barron, president, Orla, Tex., plans power development costing around $45,000, including transmission lines and two small substations.

WICHITA FALLS, TEX.—Ball Bros. will spend $100,000 for improvements to plants.

### Minnesota

ADRIAN, MINN.—City is considering extensions to power plant and may install a diesel engine generating unit and accessories. Druar & Milinowski, Globe building, St. Paul, are engineers.

MADELIA, MINN.—City plans construction of municipal power plant and will install diesel engine generating units and auxiliary equipment. Engineers are Burlingame, Hitchcock & Estabrook Inc., Sexton building, Minneapolis.

### Kansas

MOUNDRIDGE, KANS. — Continental Oil Co., Ponca City, Okla., plans to build a gasoline-engined electric light and power plant. Cost will be about $75,000.

### South Dakota

ALCESTER, S. DAK.—REA has approved loan of $208,000 to Lincoln-Union Electric Co. to finance erection of rural transmission lines. Robert Wennblom is president.

### Iowa

CORNING, IOWA—Board of waterworks trustees, Dr. Fred Binder, chairman, is taking bids until August 3 for extensions to waterworks system, including treating plant, filter equipment, and pumps. Young & Stanley Inc., Muscatine, Iowa, are engineers.

ORANGE CITY, IOWA—City is taking bids until July 19 for a diesel engine unit of not less than 575 horsepower nor more than 625 horsepower, with necessary accessories. C. Van de Steeg is mayor.

PRIMGHAR, IOWA—City council plans to build a new municipal power plant and is arranging a bond issue. Estimated cost is approximately $125,000.

ROCKWELL, IOWA — City is taking bids until 10 a. m., July 29, for construction of a municipal light and power plant, to include cooling tower, oil tanks, three diesel engines complete with electric generators and accessories, and a complete distribution system. Young & Stanley Inc., Muscatine, Iowa, are engineers.

STORM LAKE, IOWA—City council has authorized special election August 25 to vote on issuance of $330,000 bonds to finance construction of a municipal light plant.

### Nebraska

HOLDREDGE, NEBR.—Robert Fulton, engineer, Lincoln, Nebr., has been authorized by city council to purchase and install a new diesel generator at city light plant. Estimated cost is $68,000.

### Idaho

TWIN FALLS, IDAHO—Idaho Power Co. plans construction of a new power plant on Snake river, capacity 2000 kilowatts, cost about $150,000.

### Pacific Coast

LOS ANGELES — Aluminum Co. of America plans construction of a new plant at Fruitland avenue and Magnolia street, Vernon, Calif. Bethlehem Steel Co., 11100 South Central avenue, has contract for structural steel.

LOS ANGELES—Johns Manville Corp., 22 East Fortieth street, New York, plans to build a new insulating products plant and to install electric power equipment. Cost will be close to $1,000,000.

LOS ANGELES—Pacific Wire Products Co., 1955 East Sixteenth street, plans to build a plant on Alameda street, Compton, Calif., comprising an area of 25,000 square feet. Latisteel Corp., 3110 Foothill boulevard, Pasadena, has general contract.

SANTA PAULA, CALIF.—Limoneira Co., 117 North Tenth street, plans construction of an addition to its packing plant and will install electric power equipment. Cost is estimated at $85,000. Roy C. Wilson and Geoffrey N. Lamford, Say road, are architects.

ANACORTES, WASH.—Anacortes Plywood Inc. will start construction in August of first unit of proposed $400,000 plant. J. J. Lucass is president.

SPOKANE, WASH.—Beryl Metals Co. plans construction of a reduction plant for producing a beryllium alloy of steel, iron and copper.

### Canada

BURNABY, B. C. — Ford Motor Co. of Canada, Windsor, Ont., will let contracts soon for construction of an assembly plant costing $500,000.

# Comments

***Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.***

## Mill Man Suggests Reading

*To the Editor:*

Much has been said recently on how to get men to think. (STEEL, July 5.) Working as I do in the steel mills, I have found that the one way to get say, a catcher, heater, or a charger to think is by telling how they do his job in another mill, how some other mill is run, or how some new mill like his is being built some place.

Of course, these talks were on the job while the mill was down for heat, the rollhands were on their spell, or some similar delay when the men had nothing to do and had read all the newspapers, etc., that were at hand.

To my notion this is a wonderful opportunity for a company to get the men to thinking. Book racks, scattered through the mills, with current steel magazines and trade periodicals would be well worth the subscription prices because the men would read them just to have something to while the time away.

This pickup reading is just what is needed to start a man thinking. He reads something that is contrary to his past experience or that is new to him and right way he will start to talk to his buddies about it. If it doesn't help him, the fact that he will talk about his work may be helping some new and greener man to acquire greater proficiency in his work, thereby tending to break down the wall of secrecy that the older mill men love to build up around their jobs.

The argument that a man might neglect his job is out because if a mill man is on tonnage, as many are, he'll see that production is kept up. And the fact that he might misunderstand financial statements, etc., is out, in my opinion, because in a good publication he will get the truth, which is more than a union organizer will tell him.

I have tried offering magazines and articles about the mills to millhands, and second helpers, laborers, office workers, and others and in *every* case they were glad to get them, some even saying that they would like to save them. One Italian charger, speaking broken English, even came to me to suggest something for him to read. The trouble is they have not had much education and do not even know that these publications exist.

I think that some plan of exposing the men on the mills to the unquestioned benefits of reading is worthy of consideration.

F. F. MCCLURE,
*Slab checker, blooming mill dep't., Otis Steel Co., Cleveland.*

## Why Not a Tin Roof?

*To the Editor:*

With the retirement of Fred Fuller as noted in the July 5 issue of STEEL, the metal roofing industry has lost one of its greatest exponents and champions.

His business life has been a profitable and useful one, as his belief in the products he handled never wavered. The trade owes him a debt of gratitude for the work he has done in his efforts to keep up the standard of roofing tin.

For many years past it seems to those of us who are making a business of the distribution of sheet metals as if we had to sort of *apologize* for getting a tin roof specified or applied. However, my own faith in the merits of the metal roof as represented by tin, to say nothing of the actual experience I have had during a life time of handling metals, makes me feel the burden of proof should be on the other side; that is, as to why a tin roof should not be used.

If the makers of terne plates for roofing purposes could fully realize the great market before them, which will surely open up for tin roofs, with proper advertising and publicity back of it, they would start such a campaign now.

It is indeed a wonderful product when properly made and well applied. The metal has stood the test of time and the elements most successfully. It has taken an awful beating and is still going strong.

WARREN CARTER
*The Carter, Donlevy Co., Philadelphia.*

## Reminder for Salesmen

*To the Editor:*

I was very much impressed by the article entitled "What Can I Do to Make Them Think?" which appeared in STEEL of July 5.

You may care to run something in connection with this subject which I think is of great importance. It is this. Almost every day in the week I have one or more visitors who, whether they have or have not interviewed me previously, apparently have the idea that I know all about their proposition. They start right in talking and very often I am completely in the dark as to the subject of their errand until something they say gives me a clue as to what they want.

Also, I am supposed to know the names of all these visitors. As it happens I am not very good on remembering names, and it happens frequently that I do not get it at all during the interview.

Sales managers will do well to remind their salesmen that when they make calls they should be sure to state their names, the name of their company and explain clearly the object of the call, and all this right at the start of the interview.

Salesmen will do well to remember that every busy individual is living about 90 per cent in his own little shell. It does not pay them to take very much for granted.

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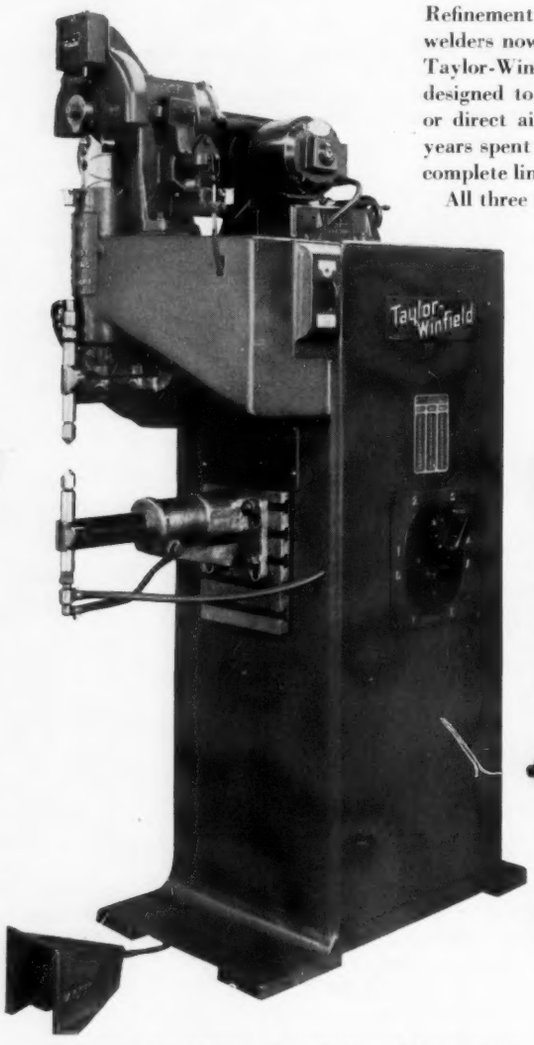
All three types of units are built with transformer capacities of 20, 28, 35, 50, 60 or 75 KVA, with 8-step voltage changing regulator as standard equipment or with 16 or more steps of heat regulation if desired. Throat depths of 12, 18 and 24 inches are available.

The DIRECT Air operated "EN" shown above is similar to the Motor Driven Welder in design and construction except that power is applied through the medium of a double acting air cylinder. Foot switch with solenoid operated air control valve or foot operated air control valve may be furnished. Standard features include automatic air line lubricator, pressure gauge calibrated in pounds pressure at the welding points, and air pressure reducing valve.

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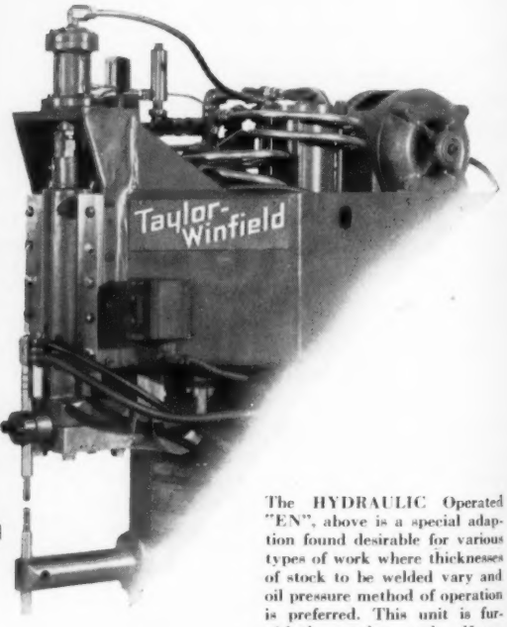


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